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Director of Nuclear Reactor Regulation
ATTN: Mr. J. F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
Resolution of Environmental Qualification
Safety Evaluation Report Deficiencies - ANO-1

Gentlemen:

On April 26, 1984, in Bethesda, various NRC personnel met with AP&L to discuss the environmental qualification deficiencies for equipment at ANO-1 and 2. At that time, AP&L described the various steps that have been taken or will be taken to resolve each of the deficiencies. The proposed resolutions are documented in the attached matrix (Enclosure 1). This is essentially the same document submitted to you prior to the meeting (reference 1), but has been modified per NRC comments and suggestions to enhance its readability.

Discussions on a number of issues not directly related to equipment, but of a generic nature also took place. The purpose of this letter is to document the results of all pertinent items discussed during the meeting. The NRC specifically requested that these meeting notes reflect the following:

1. Our proposed resolution of the TER deficiencies.
2. Our method of compliance with 10CFR50.49 sections b(1), b(2), and b(3).
3. The status of any outstanding justifications for continued operation (JCO's).

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MEMBER MIDDLE SOUTH UTILITIES SYSTEM

As mentioned previously, the device specific deficiencies identified by Franklin Research Center are identified in the attached matrix. In addition, section 1 of the matrix covers the "generic" program deficiencies that were noted. All items were discussed and no major problems were noted. In response to one specific request, AP&L hereby confirms that the post-accident harsh environments assumed for the purposes of this equipment qualification program envelope the worst-case conditions, and those environmental profiles and assumptions have been approved by the NRC.

Concerning the scope of 10CFR50.49 (item 2 above), category b(1) equipment was addressed as described in previous submittals (see references 2 through 6). To reiterate, the environmental effects (including flooding) from all postulated design basis accidents (both inside and outside containment) analyzed in Chapter 14 of the ANO-1 FSAR were considered in the identification of safety-related electrical equipment to be environmentally qualified. These accidents include LOCA's and the Main Steam Line Break inside containment, and various High Energy Line Breaks (HELB's) outside containment. Those systems required to perform the following functions were first identified:

1. Detect the accident and initiate protective actions.
2. Carry out safeguards system actions to mitigate the consequences of the accident.
3. Shut the reactor down, maintain it in a safe shutdown condition, and dissipate decay heat.
4. Provide essential auxiliary support services such as electric power, cooling water, lubrication, etc.
5. Maintain suitable environmental conditions for equipment operation (e.g., pump room cooling).

All devices within those systems which are essential to achieving the above functions were included on the EQ equipment list.

In order to ensure completeness of the list, AP&L took several steps to ensure that equipment "whose failure under postulated accident conditions could prevent satisfactory accomplishment of safety functions" were not omitted from the EQ list (10CFR50.49 section b(2)).

1. In preparation of the EQ list, P&ID's were reviewed to select those components considered essential without regard to any previous designation such as "Q - non Q".
2. The wiring diagrams (schematics) for each device identified as described above were reviewed to identify any auxiliary devices within the circuitry of the required device whose failure to function due to the postulated accident could prevent the proper functioning of the required device. All such devices found were therefore considered essential and included in the EQ list.

3. As mentioned previously, auxiliary (support) systems were considered in the preparation of the main list (e.g., lube oil, cooling water, etc.).
4. Nonsafety-related electrical circuits indirectly associated with the safety-related electrical equipment were considered by virtue of the electrical design criteria used for ANO including the use of industry standards (e.g., IEEE). The protection systems at ANO-1 conform to IEEE 279 which includes consideration of protective and control systems interaction, separation criteria, etc. Protection is further assured by proper design considerations such as use of protective fuses, relays and circuit breakers.
5. All devices determined to be in a non-harsh environment were checked to ensure that supporting electrical equipment (handswitches, terminal boxes, motor control centers, etc.), were not located in a harsh environment.

Any devices identified by the above steps were included on the EQ equipment list since they were considered de facto safety-related.

In preparation of the main list, many devices which provided control room indication for post-accident monitoring were included on the list (10CFR50.49 section b(3)). In addition, AP&L is currently addressing the requirements of Reg. Guide 1.97. It is expected that additional instrumentation (namely, category I and II equipment) requiring environmental qualification will be identified as a result of this effort, consequently, all such instrumentation will be demonstrated to meet the environmental qualification requirements as agreed to by the staff and in accordance with a scheduled ~~ε~~ approved by the staff.

In conclusion, we believe that AP&L's master list of environmental qualification equipment (Enclosure II), complies with the scope requirements of 10CFR50.49 section b.

As indicated during the meeting, all ANO-1 EQ equipment will be qualified by the end of the next refueling outage, and many existing devices still have JCO's in effect. We have updated these JCO's and provided them in Enclosure III of this letter. Based on these JCO's, we believe that ANO-1 can continue to operate without undue risk to the public health and safety.

One additional item which drew significant discussion at the meeting involved AP&L's efforts to "maintain" qualification of the equipment throughout plant life. AP&L acknowledges the importance of proper maintenance concerns, and has taken steps to put in place a comprehensive program to address this matter. When fully implemented the program will:

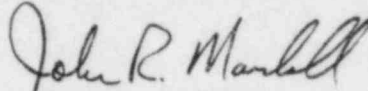
1. Ensure that all items on the EQ list receive special maintenance considerations whenever that device is affected by:
 - a. Corrective maintenance
 - b. Preventive maintenance
 - c. Surveillance

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2. Ensure that periodic part replacements, lubrications, etc., that are required to maintain qualification are performed and documented.
3. Ensure that actions required to address aging degradations are taken, and evaluations made and documented.

We trust that the efforts made and those yet to be made as described in this submittal are sufficient to allow the NRC to issue a supplemental SER for ANO-1 indicating that A&L's Environmental Qualification Program meets the requirements of 10CFR50.49 and that the deficiencies noted in previous SER's are considered resolved.

Very truly yours,



John R. Marshall
Manager, Licensing

JRM/CHT/ac

Attachments

REFERENCES ANO-1

1. April 20, 1984 letter from J. R. Marshall to Messrs. Stolz and Miller (OCAN948407).
2. October 31, 1980 letter from William Cavanaugh, III to Mr. K. V. Seyfrit (1-100-29 and 2-100-22).
3. December 16, 1980 letter from William Cavanaugh, III to Mr. H. R. Denton (1-120-09 and 2-120-20).
4. October 2, 1981 letter from David C. Trimble to Mr. J. F. Stolz (1CAN108101).
5. April 28, 1983 letter from J. R. Marshall to Mr. J. F. Stolz (1CAN048315).
6. May 20, 1983 letter from Mr. J. R. Marshall to Messrs. Clark and Stolz (OCAN058311).

ENCLOSURE I

MATRIX OF QUALIFICATION DEFICIENCIES
AND PROPOSED RESOLUTION
ANC-1

INDEX - TER DEFICIENCIES - ANO-1

- I. Generic EQ Deficiencies
- II. Motor Operated Valves
- III. Solenoid Valves
- IV. Motors
- V. Pressure, DP, Flow, and Level Transmitters
- VI. Temperature Sensing Devices
- VII. Valve Position Indicating Devices
- VIII. Electrical Distribution Devices
- IX. Miscellaneous
- X. Items not Reviewed by Franklin

I. GENERIC EQ DEFICIENCIES

<u>Deficiency</u>	<u>Reference</u>	<u>Resolution</u>
A. Completeness of safety-related electrical equipment list: "A complete list of display instrumentation mentioned in the HELB and LOCA emergency procedures must be provided... Instrumentation which is not considered to be safety-related but which is mentioned in the emergency procedure should appear on the list."	TER Section 4.3.1	This item will be completely addressed as part of the current program addressing NUREG-0737 supplement 1. Specifically, the Control Room Design Review process, when completed, will demonstrate that the appropriate instrumentation used by operators to mitigate the consequences of a LOCA or HELB is of the proper quality level (i.e. environmentally qualified). This requires significant coordination between the CRDR, Reg. Guide 1.97, and Emergency Operating Procedures review teams.
B. Containment Spray System. "The staff requires the licensee to verify that the containment spray system is not subject to a disabling single component failure..."	TER Section 4.3.2	The verification was provided by our response dated April 28, 1983 (ICAN048315).
C. Environmental Service Condition. "The staff has reviewed this concern and concludes that the containment temperature/pressure profiles... of the FSAR, are acceptable for use in equipment qualification."	TER Section 4.3.3.1	This concern is considered closed since the FSAR profiles accepted by the Staff are the basis for the inside containment service conditions established by AP&L for equipment qualification.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
1.	CV-1270 (Limitorque) CV-1271 CV-1272 CV-1273 CV-2215 CV-2221 CV-1053	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, these devices are considered fully qualified. AP&L records indicate that CV-2215 and CV-2221 are fully qualified as described above except that we have been unable to confirm motor qualification (motor nameplates have been removed). Therefore, AP&L is obtaining fully qualified replacement motors which will be installed prior to the EQ deadline. The entire device will then be qualified.
2.	CV-6205 (Limitorque) CV-7453	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
3.	CV-4803 (Limitorque)	IIa	Similarity, Aging	<p>AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, this item is considered fully qualified.</p>
4.	CV-1216 (Limitorque) CV-1214	IIa	Similarity, Aging, Temperature, Pressure, Chemical Spray, Submergence, Radiation	<p>AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; the remaining deficiencies were due to mistaken identity of these devices. Walkdowns have confirmed proper identification as fully qualified "inside containment" actuators. Therefore, these devices are considered fully qualified.</p>

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
5.	CV-1054 (Limatorque)	IIa	Similarity, Aging, Temperature, Pressure, Chemical Spray, Submergence, Radiation	This device is being replaced with a fully qualified Limatorque actuator.
6.	CV-1221 (Limatorque)	IIa	Similarity, Aging, Radiation	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; also AP&L has determined that the previous "required" radiation level was in error and should have been 3.5 E4 rads; therefore, radiation is no longer an outstanding item. Therefore, this item is considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
7.	CV-1274 (Limitorque) CV-7454	IIa	Similarity, Aging, Radiation	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; also AP&L has determined that the previous "required" radiation level was in error and should have been 3.5 E4 rads; therefore, radiation is no longer an outstanding item. Also, CV-7454 has been replaced by SV-7454 (see Section X, item 5A). Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
8.	CV-2667 (Limitorque)	IIa	Similarity, Aging, Temperature	<p>AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Also, recent reanalyses have been performed which lower the postulated temperature to a qualified level. Therefore, these devices are considered fully qualified.</p>
9.	CV-2620 (Limitorque)	IIc	Aging	<p>AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, this item is considered fully qualified.</p>

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
10.	CV-1616 (Limitorque) CV-1617	IIc	Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, these devices are considered fully qualified.
11.	CV-2680 (Limitorque) CV-2630	IIc	Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
12.	CV-2670 (Limitorque)	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, this item is considered fully qualified.
13.	CV-2617 (Limitorque)	IIa	Similarity, Aging, Temperature	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Also recent re-analyses have been performed which lower the postulated temperature to a qualified level. Therefore, this item is considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
14.	CV-1000 (Limitorque)	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; Therefore, this item is considered fully qualified.
15.	CV-1300 (Limitorque) CV-1301	IIa	Similarity, Aging, Radiation	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; also additional radiation analyses have been performed which lower the "required" radiation dose below the qualified level; therefore, radiation is no longer an outstanding item. Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
16.	CV-3821 (Limitorque)	IIc	Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, this device is considered fully qualified.
17.	CV-1405 (Limitorque)	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, this item is considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
18.	CV-1406 (Limitorque)	IIa	Similarity, Aging, Radiation	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; also additional radiation analyses have been performed which lower the "required" radiation dose below the qualified level; therefore, radiation is no longer an outstanding item. Therefore, this item is considered fully qualified.
19.	CV-1407 (Limitorque) CV-1408	IIa	Similarity, Aging, Radiation	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; also additional radiation analyses have been performed which lower the "required" radiation dose below the qualified level; therefore, radiation is no longer an outstanding item. Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
20.	CV-3822 (Limitorque)	IIc	Aging	AP&L has on file sufficient documentation to establish similarity of this device to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, this item is considered fully qualified.
21.	CV-3823 (Limitorque)	IIc	Aging	AP&L has on file sufficient documentation to establish similarity of this device to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, this item is considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
22.	CV-1227 (Limitorque) CV-1228 CV-1206	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, these devices are considered fully qualified.
23.	CV-7443 (Limitorque) CV-7447 CV-7451 CV-3812	IIc	Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
24.	CV-1400 (Limiter torque) CV-1401	IIa	Similarity, Aging, Radiation	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; also additional radiation analyses have been performed which lower the "required" radiation dose below the qualified level; therefore, radiation is no longer an outstanding item. Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
25.	CV-7452 (Limitorque) CV-7445 CV-7449 CV-2400 CV-2401 CV-1404 CV-1234 CV-1219 CV-1220 CV-3813	IIa	Similarity, Aging, Radiation	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file; also additional radiation analyses have been performed which lower the "required" radiation dose below the qualified level; therefore, radiation is no longer an outstanding item. CV-1404 is considered qualified but is needed for cold shutdown only and therefore considered outside the scope of 10CFR50.49.
26.	CV-7450 (Limitorque) CV-7448 CV-7446 CV-7444	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test reports/analysis) on file. Therefore, these devices are considered fully qualified.

II. MOTOR OPERATED VALVES

<u>Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
27.	CV-1814 (Limitorque) CV-1816 CV-1820 CV-1826	IIa	Similarity, Aging	AP&L has on file sufficient documentation to establish similarity of these devices to those qualified by specific test reports, also on file. Similarity was further confirmed by walkdown of nameplate data. Once similarity is established, Aging is considered satisfied by additional documentation (test report/analysis) on file. Therefore, these devices are considered fully qualified.
28.	CV-2627 (Rotork)	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L has replaced these valve operators with qualified Limitorque actuators as part of the EFW system upgrade. Therefore, this item is considered fully qualified.
29.	CV-2626 (Rotork)	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L has replaced these valve operators with qualified Limitorque actuators as part of the EFW system upgrade. Therefore, this item is considered fully qualified.
30.	CV-4446 (Rotork)	Ia	None	This item is fully qualified.
31.	CV-5612 (Rotork)	Ia	None	This item is fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
32.	CV-2220 (Rotork)	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L was originally replacing the torque switch with a qualified replacement. According to Rotork, this will result in a fully qualified actuator (the test failure involved torque switch failure at elevated temperature); however, it has since been determined that this device performs its function in a mild environment; therefore, it is considered outside the scope of 10CFR50.49.
33.	CV-2235 (Rotork)	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L was originally replacing the torque switch with a qualified replacement. According to Rotork, this will result in a fully qualified actuator (the test failure involved torque switch failure at elevated temperature); however, it has since been determined that this device performs its function in a mild environment; therefore, it is considered outside the scope of 10CFR50.49.
34.	CV-3809 (Rotork)	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L is replacing the torque switch with a qualified replacement. According to Rotork, this will result in a fully qualified actuator (the test failure involved torque switch failure at elevated temperature). Therefore, this item will be considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
35.	CV-3803 (Rotork)	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L is replacing the torque switch with a qualified replacement. According to Rotork, this will result in a fully qualified actuator (the test failure involved torque switch failure at elevated temperature). Therefore, this will be considered fully qualified.
36.	CV-3810 (Rotork) CV-3808	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L is replacing the torque switch with a qualified replacement. According to Rotork, this will result in a fully qualified actuator (the test failure involved torque switch failure at elevated temperature). Therefore, these devices will be considered fully qualified.
37.	CV-1410 (Rotork)	Ia	None	This item is fully qualified.
38.	CV-1050 (Rotork)	Ia	None	This item is fully qualified.
39.	CV-1415 (Rotork) CV-1414	Ia	None	These items are fully qualified.
40.	CV-3801 (Rotork) CV-3800 CV-3802	IIb	Documentation Inadequate, Temperature, Test Failures	AP&L is replacing the torque switch with a qualified replacement. According to Rotork, this will result in a fully qualified actuator (the test failure involved torque switch failure at elevated temperature). Therefore, these devices will be considered fully qualified.

II. MOTOR OPERATED VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
149.	CV-5611 (Electrodyne)	IIa	Similarity, Aging	This device has since been determined to perform its function in a mild environment; therefore, it is considered outside the scope of 10CFR50.49.
152.	E/H-1428 (Bailey Meter)	IIa	Documentation Inadequate	This device has been modified; it is now an air operated valve with ASCO solenoids. Therefore, it is considered fully qualified.
153.	E/H-1429 (Bailey Meter)	IIa	Documentation Inadequate	This device has been modified; it is now an air operated valve with ASCO solenoids. Therefore, it is considered fully qualified.
154.	CV-2133 (ITT General) CV-2123 CV-2136 CV-2125	Iia	Aging, Steam Exposure	Aging will be specifically addressed by AP&L maintenance/surveillance program. These operators are not required to operate in any steam environment; therefore, the issue of "steam exposure" is not considered an outstanding item. Therefore, these devices are considered fully qualified.

III. SOLENOID VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
41.	SV-2103 (ASCO)	IIa	Documentation Inadequate	This device has been determined to complete its function in a mild environment; and no failures can be identified due to the subsequent harsh environment which could cause the valve to reopen; therefore, it is considered fully qualified.
42.	SV-1845 (ASCO)	IIa	Documentation Inadequate	This device has been determined to complete its function in a mild environment; and no failures can be identified due to the subsequent harsh environment which could cause the valve to reopen; therefore, it is considered fully qualified.
43.	SV-2102 (ASCO)	IIa	Documentation Inadequate	This device has been determined to complete its function in a mild environment; and no failures can be identified due to the subsequent harsh environment which could cause the valve to reopen; therefore, it is considered fully qualified.
44.	SV-3805 (ASCO)	IIa	Documentation Inadequate	This device will be replaced with a qualified ASCO solenoid valve by the EQ deadline. Therefore, it will be considered fully qualified.
45.	SV-3804 (ASCO)	IIa	Documentation Inadequate	This device will be replaced with a qualified ASCO solenoid valve by the EQ deadline. Therefore, it will be considered fully qualified.

III. SOLENOID VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
46.	SV-3840 (ASCO) SV-3841	IIa	Documentation Inadequate	This device will be replaced with a qualified ASCO solenoid valve by the EQ deadline. Therefore, it will be considered fully qualified.
47.	SV-3814 (ASCO)	IIa	Documentation Inadequate	This device will be replaced with a qualified ASCO solenoid valve by the EQ deadline. Therefore, it will be considered fully qualified.
48.	SV-3815 (ASCO)	IIa	Documentation Inadequate	This device will be replaced with a qualified ASCO solenoid valve by the EQ deadline. Therefore, it will be considered fully qualified.
49.	SV-2105 (ASCO) SV-2104 SV-2100 SV-2101 SV-2106	IIa	Documentation Inadequate	These devices have been determined to complete their function in a mild environment; no failures can be identified due to the subsequent harsh environment which could cause the valves to re-open; therefore, they are considered fully qualified.
50.	SV-4804 (ASCO)	IIa	Documentation Inadequate	This device has been determined to complete its function in a mild environment; no failures can be identified due to the subsequent harsh environment which could cause the valves to re-open; therefore, they are considered fully qualified.

III. SOLENOID VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
51.	SV-4400 (ASCO)	IIa	Documentation Inadequate	This device has been determined to complete its function in a mild environment; no failures can be identified due to the subsequent harsh environment which could cause the valves to re-open; therefore, they are considered fully qualified.
52.	SV-1052 (ASCO)	IIa	Documentation Inadequate	This device has been determined to complete its function in a mild environment; no failures can be identified due to the subsequent harsh environment which could cause the valves to re-open; therefore, they are considered fully qualified.
53.	SV-6201 (ASCO) SV-6202 SV-6203	IIa	Documentation Inadequate	These devices are not exposed to harsh environment conditions from any accident for which they are required to function; therefore, they are considered outside the scope of 10CFR50.49.
54.	SV-1668 (ASCO) SV-1667	IIa	Documentation Inadequate	These devices are not exposed to harsh environment conditions from any accident for which they are required to function; therefore, they are considered outside the scope of 10CFR50.49.

III. SOLENOID VALVES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
55.	SV-2244 (ASCO) SV-2243 SV-2214 SV-2213 SV-2234 SV-2233 SV-1065A SV-1065B	IIa	Documentation Inadequate	These devices are not exposed to harsh environment conditions from any accident for which they are required to function; therefore, they are considered outside the scope of 10CFR50.49.
56.	SV-2692 (Peter Paul)	IIa	Documentation Inadequate	This item has been replaced with a fully qualified ASCO solenoid valve.
57.	SV-2691 (Norgreen)	IIa	Documentation Inadequate	This item has been replaced with a fully qualified ASCO solenoid valve.
58.	SV-1818 (Target Rock)	IIa	Similarity	AP&L has on file the necessary documentation to establish similarity between the installed device and the tested device. Therefore, this item is considered fully qualified.
59.	SV-7503 (Target Rock) SV-7502 SV-7501 SV-7500	IIa	Similarity, Aging	AP&L has on file the necessary documentation to establish similarity between the installed device and the tested device; also AP&L has included these items in the maintenance/surveillance program to address Aging degradation. Therefore, they are considered fully qualified.

IV. MOTORS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
114.	SV-7410 (RB Coolers Bypass Damper Motors) SV-7411 (General Electric) SV-7412 SV-7413	IIa	Documentation Inadequate	These devices were previously determined to perform a non-essential safety function and were considered outside the scope of 10CFR50.49. However, a recent re-evaluation has determined that the devices should be re-added to the list of equipment to be qualified. AP&L has recently confirmed these devices to be Reliance class B motors. Though they have operating times of less than one minute, we are committing to replace the motors by the EQ deadline with fully qualified replacements.
115.	VUCM-1B (room coolers) VUCM-1A (Allis Chalmers)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for these motors, and at a maximum the postulated dose is 1.3 E7 rads. Material analyses have been performed to qualify the motors to this level. Therefore, they are considered fully qualified.
116.	VUCM-1C (room coolers) VUCM-1D (Allis Chalmers)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for these motors, and at a maximum the postulated dose is 1.3 E7 rads. Material analyses have been performed to qualify the motors to this level. Therefore, they are considered fully qualified.

IV. MOTORS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
117.	VUCM-7B (room cooler) (Louis Allis)	IIa	Documentation Inadequate	Type testing, similarity analyses, and material analyses have been performed demonstrating qualification of these motors for their intended use. The motors are located outside containment, exposed to maximum radiation dose of less than 2 E6 rads, and not exposed to saturated steam conditions. Therefore, this item is considered fully qualified.
118.	VUCM-7A (room cooler) VUCM-7B (Louis Allis)	IIa	Documentation Inadequate	Type testing, similarity analyses, and material analyses have been performed demonstrating qualification of these motors for their intended use. The motors are located outside containment, exposed to maximum radiation dose of less than 2 E6 rads, and not exposed to saturated steam conditions. Therefore, these devices are considered fully qualified.
119.	VEFM-37B (Hydrogen purge blower motors) VSFM-30B (General Electric)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for these motors, and the maximum postulated dose is only 5 E6 rads. Materials analyses have been performed to qualify the motors to these levels. Therefore, they are considered fully qualified.

IV. MOTORS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
120.	VEFM-37A (Hydrogen purge blower motors) VSFM-30A (General Electric)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for these motors, and the maximum postulated dose is only 5 E6 rads. Materials analyses have been performed to qualify the motors to these levels.
121.	CM-19A (Hydrogen Sampler Motor) (Reliance Electric)	IIa	Documentation	This device is being relocated to a mild environment; therefore, it will be considered outside the scope of 10CFR50.49 after the relocation is completed.
122.	CM-19B (Hydrogen Sampler motor) (Reliance Electric)	IIa	Documentation Inadequate	This device is being relocated to a mild environment; therefore, it will be considered outside the scope of 10CFR50.49 after the relocation is completed.
123.	VSFM-1A (containment cooling motor) (Reliance) VSFM-1B VSFM-1C VSFM-1D	IV	Documentation Not Available	Test documentation is available in the EQ files which qualifies these motors.
124.	VEFM-38A (penetration room filter system motor) VEFM-38B (Westinghouse)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for these motors, and the maximum postulated dose is only 3 E5 rads. Materials analyses have been performed to qualify the motors to these levels, therefore, they are considered fully qualified.

IV. MOTORS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
125.	PM-36B (HPI motor) (Westinghouse)	IIa	Documentation Inadequate	Type testing, similarity analyses, and material analyses have been performed demonstrating qualification of this motor for its intended use. The motor is located outside containment, exposed to maximum radiation dose of less than 2 E6 rads, and not exposed to saturated steam conditions. Therefore, it is considered fully qualified.
126.	PM-35A (Cont. spray motor) (Westinghouse)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for this motor, and the maximum postulated dose is 1.4 E7 rads. Materials analyses have been performed to qualify the motor to this level. Therefore, it is considered fully qualified.
127.	PM-34A (LPI motor) (Westinghouse)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for this motor, and at a maximum the postulated dose is 1.8 E6 rads. Material analyses have been performed to qualify the motor to this level, therefore, it is considered fully qualified.

IV. MOTORS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
128.	PM-36A (HPI motors) PM-36C (Westinghouse)	IIa	Documentation Inadequate	Type testing, similarity analyses, and material analyses have been performed demonstrating qualification of these motors for their intended use. The motors are located outside containment, exposed to maximum radiation dose of less than 2 E6 rads, and not exposed to saturated steam conditions. Therefore, they are considered fully qualified.
129.	PM-34B (LPI motor) PM-35B (Cont. spray motor) (Westinghouse)	IIa	Documentation Inadequate	Radiation is the only harsh parameter for these motors, and at a maximum the postulated dose for PM-34B is 1.3 E7 rads and PM-35B is 2.6 E6 rads. Material analyses have been performed to qualify the motors to this level, therefore, they are considered fully qualified.

V. PRESSURE, DP, FLOW, AND LEVEL TRANSMITTERS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
58.	LE-5645 (Gems) LE-5646	Ib	Documentation Inadequate	Testing is complete; the device is considered fully qualified by the test documentation.
59.	LE-1405B (Gems)	Ib	Documentation Inadequate	Testing is complete; the device is considered fully qualified by the test documentation.
92.	PDT-2670A (Rosemount) PDT-2670B	IIa	Aging, Radiation	These devices were recently replaced with qualified Rosemount 1153 D series transmitters. Aging will be addressed (including periodic replacement of limited life components) by maintenance/ surveillance programs which will be fully implemented by the EQ deadline. Therefore, they are considered fully qualified.
93.	PDT-2620A (Rosemount) PDT-2620B	IIc	Aging	These devices were recently replaced with qualified Rosemount 1153D series transmitters. Aging will be addressed (including periodic replacement of limited life components) by maintenance/ surveillance programs which will be fully implemented by the EQ deadline. Therefore, they are considered fully qualified.
94.	PDT-7441 (Fisher & Porter) PDT-7451	IIa	Similarity, Aging Accuracy, Operating Time	These devices will be replaced with qualified Rosemount transmitters by the EQ deadline. Therefore, they will be considered fully qualified.

V. PRESSURE, DP, FLOW, AND LEVEL TRANSMITTERS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
95.	PDT-7442 (Fisher & Porter) PDT-7452	IIa	Similarity, Aging Accuracy, Operating Time	These devices are being replaced with qualified Rosemount transmitters. Therefore, they will be considered fully qualified.
96.	PDT-2120 (Fisher & Porter)	IIa	Similarity, Aging Accuracy, Operating Time	This device has been relocated to a mild environment; therefore, it is considered outside the scope of 10CFR50.49.
97.	PDT-2121 (Fisher & Porter) PDT-2130 PDT-2131	IIa	Similarity, Aging Accuracy, Operating Time	These devices have been relocated to a mild environment; therefore, they are considered outside the scope of 10CFR50.49.
98.	PDT-2400 (Bailey Meter)	IIa	Similarity, Aging Accuracy, Operating Time	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.
99.	PDT-1028 (Bailey Meter) PDT-1029 PDT-1030 PDT-1031 PDT-1034 PDT-1035 PDT-1036 PDT-1037	IIa	Similarity, Aging Profile not enveloped, Chemical Spray, Accuracy	These devices are being replaced with qualified Rosemount transmitters. Therefore, they will be considered fully qualified.
100.	PDT-1401 (Bailey Meter)	IIa	Similarity, Aging Accuracy, Operating Time	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.

V. PRESSURE, DP, FLOW, AND LEVEL TRANSMITTERS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
101.	PDT-1402 (Bailey Meter) PDT-1228 PDT-1230 PDT-1209 PDT-1210	IIa	Similarity, Aging Accuracy, Operating Time	These devices are being replaced with qualified Rosemount transmitters. Therefore, they will be considered fully qualified.
102.	LT-1001 (Bailey Meter)	IIa	Similarity, Aging Profile not enveloped, Chemical Spray, Accuracy	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.
103.	LT-1002 (Bailey Meter)	IIa	Similarity, Aging Profile not enveloped, Chemical Spray, Accuracy	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.
104.	LT-1000 (Bailey Meter)	IIa	Similarity, Aging Profile not enveloped, Chemical Spray, Accuracy	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.
105.	LT-2664 (Bailey Meter) LT-2659	IIa	Similarity, Aging Profile not enveloped, Chemical Spray, Accuracy	This item will become non-essential upon completion of the EFW upgrade which will occur by the EQ deadline. It's function is being replaced by a fully qualified Rosemount transmitter.
106.	LT-2609 (Bailey Meter) LT-2614	IIa	Similarity, Aging Profile not enveloped, Chemical Spray, Accuracy	This item will become non-essential upon completion of the EFW upgrade which will occur by the EQ deadline. It's function is being replaced by a fully qualified Rosemount transmitter.

V. PRESSURE, DP, FLOW, AND LEVEL TRANSMITTERS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
107.	PT-1041 (Westinghouse)	IIa	Documentation Inadequate	This item was erroneously identified on earlier submittals; it has since been determined to perform a non-essential function therefore, it is considered outside the scope of 10CFR50.49.
108.	PT-1022 (Foxboro) PT-1040	IIa	Similarity, Aging Accuracy	These devices are being replaced with qualified Rosemount transmitters. Therefore, they will be considered fully qualified.
109.	PT-2406 (Fisher & Porter)	IIb	Steam Exposure, Radiation, Test Failures	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.
110.	PT-2405 (Fisher & Porter) PT-2407	IIb	Steam Exposure, Radiation, Text Failures	These devices are being replaced with qualified Rosemount transmitters. Therefore, they will be considered fully qualified.
111.	PT-1023 (Rosemount)	IIc	Aging	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.
112.	PT-1020 (Foxboro)	IIa	Similarity, Aging Accuracy	This device is being replaced with a qualified Rosemount transmitter. Therefore, it will be considered fully qualified.
113.	PT-1039 (Rosemount) PT-1038 PT-1021	IIc	Aging	These devices are being replaced with qualified Rosemount transmitters. Therefore, they will be considered fully qualified.

VI. TEMPERATURE SENSING DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
60.	TE-2615 (Rosemount) TE-2614 TE-2664 TE-2665	IIa	Aging, Functional Testing, Accuracy	These devices have been determined to fulfill a non-essential safety function; therefore, they are considered outside the scope of 10CFR50.49.
61.	TE-1001 (Rosemount) TE-1000	IIa	Aging, Functional Testing, Accuracy	These devices have been determined to fulfill a non-essential safety function; therefore, they are considered outside the scope of 10CFR50.49.
62.	TE-1047 (Rosemount) TE-1045 TE-1016	IIa	Aging, Functional Testing, Accuracy	Documentation will be available by the EQ deadline which fully qualifies these devices (type tests plus similarity analyses).
63.	TE-1040 (Rosemount)	IIa	Aging, Functional Testing, Accuracy	Documentation will be available by the EQ deadline which fully qualifies this device (type tests plus similarity analyses).
64.	TE-1041 (Rosemount) TE-1017 TE-1013 TE-1012	IIa	Aging, Functional Testing, Accuracy	Documentation will be available by the EQ deadline which fully qualifies these devices (type tests plus similarity analyses).
89.	TS-7442B (Fenwal) TS-7442A	IIa	Documentation Inadequate	These devices are being replaced with qualified ASCO temperature switches. Therefore, they will be considered fully qualified.
90.	TS-7441B (Fenwal)	IIa	Documentation Inadequate	This device is being replaced with a qualified ASCO temperature switch. Therefore, it will be considered fully qualified.

VI. TEMPERATURE SENSING DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
91.	TS-7441A (Fenwal)	IIa	Documentation Inadequate	This device is being replaced with a qualified ASCO temperature switch. Therefore, it will be considered fully qualified.

VII. VALVE POSITION INDICATING DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
65.	ZS-2692 (Namco) ZS-2691	IIa	Documentation Inadequate	These devices are being replaced with fully qualified Namco limit switches.
66.	ZS-3814 (Namco)	IIa	Documentation Inadequate	This device is being replaced with a fully qualified Namco limit switch.
67.	ZS-2136 (Namco) ZS-2133	IIa	Documentation Inadequate	These devices are being replaced with fully qualified Namco limit switches.
68.	ZS-2123 (Namco)	IIa	Documentation Inadequate	This device is being replaced with a fully qualified Namco limit switch.
69.	ZS-2126 (Namco)	IIa	Documentation Inadequate	This device is being replaced with a fully qualified Namco limit switch.
70.	ZS-2100 (Namco) ZS-2101 ZS-2102 ZS-2104 ZS-2105 ZS-2106 ZS-3815	IIa	Documentation Inadequate	ZS-3815 is being replaced with a fully qualified Namco limit switch. The remainder of the devices complete their functions prior to any harsh environmental conditions; no failures can be identified which could affect the valves or seriously mislead the operator; therefore, they are considered fully qualified.

VII. VALVE POSITION INDICATING DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
71.	ZS-4400 (Namco)	IIa	Documentation Inadequate	This device is being replaced with a fully qualified Namco limit switch. This device completes its function prior to any harsh environmental conditions; no failures can be identified which could affect the valves or seriously mislead the operator; therefore, they are considered fully qualified.
72.	ZS-1065 (Namco) ZS-6202 ZS-6203	IIa	Documentation Inadequate	These devices perform their functions in a mild environment, therefore, they are considered outside the scope of 10CFR50.49.
73.	ZS-7406 thru 7413 ZS-7420 thru 7427 (General Electric)	IIa	Documentation Inadequate	These devices were previously determined to perform a nonessential safety function and were considered outside the scope of 10CFR50.49. However, a recent revaluation has determined that the devices should be readded to the list of equipment to be qualified. We are committing to replace the switches by the EQ deadline with qualified Namco switches.
74.	ZS-3841 (Microswitch)	IIa	Documentation Inadequate	This device is being replaced with a qualified Namco limit switch. Therefore, it will be considered fully qualified.

VII. VALVE POSITION INDICATING DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
75.	ZS-1845 (Microswitch)	IIa	Documentation Inadequate	This device completes its function prior to any harsh environmental conditions, no failures can be identified which could affect the valves or seriously mislead the operators; therefore, the device is considered qualified.
76.	ZS-3840 (Microswitch)	IIa	Documentation Inadequate	This device is being replaced with a qualified Namco limit switch. Therefore, it will be considered fully qualified.
77.	ZS-3804 (Microswitch)	IIa	Documentation Inadequate	This device is being replaced with a qualified Namco limit switch. Therefore, it will be considered fully qualified.
78.	ZS-3805 (Microswitch)	IIa	Documentation Inadequate	This device is being replaced with a qualified Namco limit switch. Therefore, it will be considered fully qualified.
79.	ZS-1052 (Microswitch)	IIa	Documentation Inadequate	This device completes its function prior to any harsh environmental conditions, no failures can be identified that could affect the valve or seriously mislead the operator; therefore, the device is considered qualified.

VII. VALVE POSITION INDICATING DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
80.	ZS-4804 (Microswitch)	IIa	Documentation Inadequate	This device completes its function prior to any harsh environmental conditions, no failures can be identified that could affect the valve or seriously mislead the operator; therefore, the device is considered qualified.
81.	ZS-1667 (Microswitch)	IIa	Documentation Inadequate	This device performs its function in a mild environment; therefore, it is considered outside the scope of 10CFR50.49.
82.	ZS-2234 (Microswitch) ZS-2214 ZS-2233	IIa	Documentation Inadequate	These devices perform their function in a mild environment; therefore, they are considered outside the scope of 10CFR50.49.
130.	VBE-1000A (Endevco) VBE-1000B VBE-1001A VBE-1001B VBE-1002A VBE-1002B	IIa	Documentation Inadequate	Testing is complete, these devices are considered fully qualified by the type test documentation.
135.	VBY-1000A (Unholtz Dickie) VBY-1000B VBY-1001A VBY-1001B VBY-1002A VBY-1002B	IIa	Documentation Inadequate	These items have been replaced with fully qualified TEC amplifiers.

VIII. ELECTRICAL DISTRIBUTION DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
138.	GEN-1008- (Endevco) Electrical connector for acoustic monitors.	IIa	Documentation Inadequate	This device was qualified in the acoustic monitor testing program. Testing is complete, this item is considered fully qualified by the type test documentation.
139.	Electrical connector for acoustic monitors.	IIa	Documentation Inadequate	This device was qualified in the acoustic monitor testing program. Testing is complete, this item is considered fully qualified by the type test documentation.
140.	GEN-1010 - power & control cable (Okonite)	IIa	Similarity	AP&L has provided additional documentation in the EQ files which supports applicability of the referenced type test information to the cable purchased and utilized at ANO-1. We consider the documentation to be sufficient evidence of similarity. Therefore, it is considered fully qualified.
141.	Electrical cable for acoustic monitors	IIa	Documentation Inadequate	This cable was qualified with the acoustic monitors. Testing is complete, this item is considered fully qualified by the type test documentation.
142.	GEN-1003 - electrical connectors (Conax)	IIa	Similarity	These connectors were erroneously identified in previous SCEW sheets as penetrations. These devices were supplied with Bailey transmitters. Since the transmitters are being replaced, new (qualified) connectors will also be installed.

VIII. ELECTRICAL DISTRIBUTION DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
143.	GEN-1004 - electrical penetrations (Conax)	IIa	Similarity	This deficiency was due to an erroneous identification of model numbers made by AP&L on the original SCEW sheets. The proper numbers have been determined to establish similarity. Therefore, it is considered fully qualified.
144.	GEN-1005 - electrical penetrations (Conax)	IIa	Similarity	This deficiency was due to an erroneous identification of model numbers made by AP&L on the original SCEW sheets. The proper numbers have been determined to establish similarity. Therefore, it is considered fully qualified.
145.	GEN-1006 - electrical penetrations (Conax)	IIa	Similarity	This deficiency was due to an erroneous identification of model numbers made by AP&L on the original SCEW sheets. The proper numbers have been determined to establish similarity. Therefore, it is considered fully qualified.
146.	GEN-1002 - instrumentation cable (Boston Insulated Wire)	IIa	Similarity	AP&L has provided additional documentation in the EQ files which supports applicability of the referenced type test information to the cable purchased and utilized at ANO-1. We consider the documentation to be sufficient evidence of similarity. Therefore, it is considered fully qualified.

VIII. ELECTRICAL DISTRIBUTION DEVICES

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
147.	GEN-1001 - triaxial cable (Boston Insulated Wire)	IIa	Aging	AP&L has confirmed that this cable is utilized only for neutron detectors which are exempt from qualification; therefore, this item is considered outside the scope of 10CFR50.49.
148.	GEN-1007 - cable for acoustic monitors (Endevco)	IIa	Documentation	This cable was qualified with the acoustic monitors. Testing is complete, this item is considered fully qualified by the type test documentation.
155.	GEN-1009 - junction box (Foxboro)	IIa	Similarity	This is a box with connector supplied by Foxboro with certain of their transmitters and was qualified with the transmitters. Since the transmitters are being replaced, new (qualified) connectors will be installed as well.

IX. MISCELLANEOUS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
83.	PS-7503 (Barksdale) PS-7501	Ib	None pending modification	These devices were originally slated for replacement due to radiation deficiencies; however, the radiation doses have been reduced by analysis and a materials analysis has been performed which demonstrates these devices ability to withstand the postulated dose. Since radiation is the only harsh environmental parameter, these items are now considered fully qualified.
84.	PS-7502 (Barksdale) PS-7500	Ib	None pending modification	These devices were originally slated for replacement due to radiation deficiencies; however, the radiation doses have been reduced by analysis and a materials analyses has been performed which demonstrates these devices' ability to withstand the postulated dose. Since radiation is the only harsh environmental parameter, these items are now considered fully qualified.
85.	PS-2403 (ITT Barton)	Ib	None pending modification	This device is being replaced with a qualified Static-O-Ring pressure switch.
86.	PS-2401 (ITT Barton)	Ib	None pending modification	This device is being replaced with a qualified Static-O-Ring pressure switch.
87.	PS-2400 (ITT Barton)	Ib	None pending modification	This device will be replaced with a qualified Static-O-Ring pressure switch.

IX. MISCELLANEOUS

<u>FRC Item. #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
88.	PS-2402 (ITT Barton)	Ib	None pending modification	This device will be replaced with a qualified Static-O-Ring pressure switch.
131.	VEH-6A (Penwalt)	IIa	Documentation Inadequate	A materials analysis is now available which qualifies this device for the postulated radiation dose. Since this is the only harsh environmental parameter, this device is considered fully qualified.
132.	VEH-6B (Penwalt)	IIa	Documentation Inadequate	A materials analysis is now available which qualifies this device for the postulated radiation dose. Since this is the only harsh environmental parameter, this device is considered fully qualified.
133.	C-178 (Hydrogen Analyzer Panel) (Comsip Delphi)	IIa	Documentation Inadequate, Aging	This item is being relocated to a mild environment; therefore, upon completion of the relocation it will be considered outside the scope of 10CFR50.49.
134.	C-179 (Comsip Delphi)	IIa	Documentation Inadequate	This item is being relocated to a mild environment; therefore, upon completion of the relocation it will be considered outside the scope of 10CFR50.49.

IX. MISCELLANEOUS

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
136.	RE-7442 (Eberline) RE-7441	IIa	Documentation Inadequate	The function of these devices is now considered non-essential. The information is now available from the Super Particulate Iodine and Noble Gas monitor (SPING) installed as a result of NUREG 0737. The SPING which satisfies this function is located in a mild environment. Therefore this item is considered outside the scope of 10CFR50.49.
137.	RE-8060 (General Atomic) RE-8061	IIa	Documentation Inadequate	These devices were fully qualified by type tests. The documentation was previously not available for transmittal to Franklin.

X. ITEMS NOT REVIEWED BY FRANKLIN

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
1A.	SV-7454 (Target Rock) SV-7456 SV-7457 SV-7459 SV-7467 SV-7469 SV-7510 SV-7512	NA	NA	These are isolation valves added as part of recently installed systems (e.g., Post Accident Sampling System). They are qualified Target Rock solenoid valves.
2A.	SV-1428 (Asco) SV-1429	NA	NA	CV-1428 and -1429 were previously operated by electro-hydraulic actuators (see section II, item #152). They are now air operated valves with fully qualified ASCO solenoid valves.
3A.	GEN-XXXX (terminal blocks)	NA	NA	All terminal blocks used inside containment for safety-related devices (i.e., EQ list) are being replaced with qualified splices (Raychem).
4A.	GEN-XXXX (terminal blocks)	NA	NA	All terminal blocks used outside containment will be shown qualified by test reports and analyses or will be replaced with qualified Raychem splices or qualified terminal blocks.

X. ITEMS NOT REVIEWED BY FRANKLIN

<u>FRC Item #</u>	<u>Description</u>	<u>NRC Category</u>	<u>Deficiencies</u>	<u>Resolution</u>
5A.	HS-7435 (General Electric) HS-7436 HS-7437 HS-7438	NA	NA	Although these devices perform a non-essential function, a failure has been postulated that could result in the failure of other safety-related devices (SV-7410 thru SV-7413). They will be removed from the circuit by the EQ deadline.

ENCLOSURE II
ENVIRONMENTAL QUALIFICATION
EQUIPMENT LIST

ANO-1

JUNE 1, 1984

ANO-1 EQ LIST

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
1.	1	A048	CV1270	Limatorque	Qualified
2.	1	A049	CV1271	Limatorque	Qualified
3.	1	A050	CV1272	Limatorque	Qualified
4.	1	A051	CV1273	Limatorque	Qualified
5.	1	A056	CV2215	Limatorque	Qualified by 1R6
6.	1	A057	CV2221	Limatorque	Qualified by 1R6
7.	1	A044	CV1053	Limatorque	Qualified
8.	2	A012	CV6205	Limatorque	Qualified
9.	2	A097	CV7453	Limatorque	Qualified
10.	3	A010	CV4803	Limatorque	Qualified
11.	4	A047	CV1216	Limatorque	Qualified
12.	4	A046	CV1214	Limatorque	Qualified
13.	5	A045	CV1054	Limatorque	Qualified by 1R6
14.	6	B071	CV1221	Limatorque	Qualified
15.	7	B077	CV1274	Limatorque	Qualified
16.	8	B011	CV2667	Limatorque	Qualified by 1R6
17.	9	B001	CV2620	Limatorque	Qualified
18.	10	B093	CV1616	Limatorque	Qualified
19.	10	B094	CV1617	Limatorque	Qualified
20.	11	B012	CV2680	Limatorque	Qualified
21.	11	B010	CV2630	Limatorque	Qualified
22.	12	B006	CV2670	Limatorque	Qualified
23.	13	B009	CV2617	Limatorque	Qualified by 1R6

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
24.	14	A013	CV1000	Limatorque	Qualified
25.	15	B079	CV1301	Limatorque	Qualified
26.	15	B078	CV1300	Limatorque	Qualified
27.	16	B041	CV3821	Limatorque	Qualified
28.	17	B087	CV1405	Limatorque	Qualified
29.	18	B088	CV1406	Limatorque	Qualified
30.	19	B090	CV1407	Limatorque	Qualified
31.	19	B089	CV1408	Limatorque	Qualified
32.	20	B042	CV3822	Limatorque	Qualified
33.	21	B043	CV3823	Limatorque	Qualified
34.	22	B072	CV1227	Limatorque	Qualified
35.	22	B073	CV1228	Limatorque	Qualified
36.	22	B066	CV1206	Limatorque	Qualified
37.	23	B134	CV7443	Limatorque	Qualified
38.	23	B136	CV7447	Limatorque	Qualified
39.	23	B138	CV7451	Limatorque	Qualified
40.	23	B035	CV3812	Limatorque	Qualified
41.	24	B083	CV1401	Limatorque	Qualified
42.	24	B082	CV1400	Limatorque	Qualified
43.	25	B140	CV7452	Limatorque	Qualified
44.	25	B135	CV7445	Limatorque	Qualified
45.	25	B137	CV7449	Limatorque	Qualified
46.	25	B113	CV2401	Limatorque	Qualified
47.	25	B111	CV2400	Limatorque	Qualified
48.	25	B069	CV1219	Limatorque	Qualified
49.	25	B070	CV1220	Limatorque	Qualified

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
50.	25	B036	CV3813	Limatorque	Qualified
51.	26	A096	CV7450	Limatorque	Qualified
52.	26	A095	CV7448	Limatorque	Qualified
53.	26	A094	CV7446	Limatorque	Qualified
54.	26	A093	CV7444	Limatorque	Qualified
55.	27	A065	CV1814	Limatorque	Qualified
56.	27	A066	CV1816	Limatorque	Qualified
57.	27	A067	CV1820	Limatorque	Qualified
58.	27	A068	CV1826	Limatorque	Qualified
59.	28	B005	CV2627	Limatorque	Qualified
60.	29	B004	CV2626	Limatorque	Qualified
61.	30	A009	CV4446	Rotork	Qualified
62.	31	A011	CV5612	Rotork	Qualified
63.	34	B033	CV3809	Rotork	Qualified by 1R6
64.	35	B027	CV3803	Rotork	Qualified by 1R6
65.	36	B034	CV3810	Rotork	Qualified by 1R6
66.	36	B032	CV3808	Rotork	Qualified by 1R6
67.	37	D001	CV1410	Rotork	Qualified
68.	38	A043	CV1050	Rotork	Qualified
69.	39	A054	CV1414	Rotork	Qualified
70.	39	A055	CV1415	Rotork	Qualified
71.	40	B024	CV3801	Rotork	Qualified by 1R6
72.	40	B025	CV3800	Rotork	Qualified by 1R6
73.	40	B026	CV3802	Rotork	Qualified by 1R6
74.	44	B030	SV3805	Asco	Qualified by 1R6
75.	45	B028	SV3804	Asco	Qualified by 1R6

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
76.	46	B046	SV3840	Asco	Qualified by 1R6
77.	46	B044	SV3841	Asco	Qualified by 1R6
78.	47	B037	SV3814	Asco	Qualified by 1R6
79.	48	B039	SV3815	Asco	Qualified by 1R6
80.	56	B015	SV2692	Asco	Qualified (2)
81.	57	B013	SV2691	Asco	Qualified (2)
82.	58	C014	LE5646	Gems	Qualified
83.	58	C013	LE5645	Gems	Qualified
84.	59	A052	LE1405B	Gems	Qualified
85.	62	A042	TE1047	Rosemount	Qualified by 1R6
86.	62	A041	TE1045	Rosemount	Qualified by 1R6
87.	62	A021	TE1016	Rosemount	Qualified by 1R6
88.	63	A038	TE1040	Rosemount	Qualified by 1R6
89.	64	A040	TE1041	Rosemount	Qualified by 1R6
90.	64	A022	TE1017	Rosemount	Qualified by 1R6
91.	64	A020	TE1013	Rosemount	Qualified by 1R6
92.	64	A019	TE1012	Rosemount	Qualified by 1R6
93.	65	B016	ZS2692	Namco	Qualified by 1R6
94.	65	B014	ZS2691	Namco	Qualified by 1R6
95.	66	B038	ZS3814	Namco	Qualified by 1R6
96.	67	B178	ZS2136	Namco	Qualified by 1R6
97.	67	B176	ZS2133	Namco	Qualified by 1R6
98.	68	B170	ZS2123	Namco	Qualified by 1R6
99.	69	B172	ZS2126	Namco	Qualified by 1R6
100.	70	B040	ZS3815	Namco	Qualified by 1R6
101.	74	B047	ZS3841	Microswitch	Qualified by 1R6

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
102.	76	B045	ZS3840	Microswitch	Qualified by 1R6
103.	77	B029	ZS3804	Microswitch	Qualified by 1R6
104.	78	B031	ZS3805	Microswitch	Qualified by 1R6
105.	83	B149	PS7503	Barksdale	Qualified
106.	83	B145	PS7501	Barksdale	Qualified
107.	84	B147	PS7502	Barksdale	Qualified
108.	84	B143	PS7500	Barksdale	Qualified
109.	85	A061	PS2403	ITT Barton	Qualified by 1R6
110.	86	A059	PS2401	ITT Barton	Qualified by 1R6
111.	87	A058	PS2400	ITT Barton	Qualified by 1R6
112.	88	A060	PS2402	ITT Barton	Qualified by 1R6
113.	89	B133	TS7442B	Fenwal	Qualified by 1R6
114.	89	B132	TS7442A	Fenwal	Qualified by 1R6
115.	90	B129	TS7441B	Fenwal	Qualified by 1R6
116.	91	B128	TS7441A	Fenwal	Qualified by 1R6
117.	92	B008	PDT2670B	Rosemount	Qualified ⁽²⁾
118.	92	B007	PDT2670A	Rosemount	Qualified ⁽²⁾
119.	93	B003	PDT2620B	Rosemount	Qualified ⁽²⁾
120.	93	B002	PDT2620A	Rosemount	Qualified ⁽²⁾
121.	94	B127	PDT7441	Fisher & Porter	Qualified by 1R6
122.	94	B139	PDT7451	Fisher & Porter	Qualified by 1R6
123.	95	B130	PDT7442	Fisher & Porter	Qualified by 1R6
124.	95	B141	PDT7452	Fisher & Porter	Qualified by 1R6
125.	98	B112	PDT2400	Bailey	Qualified by 1R6
126.	99	A027	PDT1028	Bailey	Qualified by 1R6
127.	99	A028	PDT1029	Bailey	Qualified by 1R6

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
128.	99	A029	PDT1030	Bailey	Qualified by 1R6
129.	99	A030	PDT1031	Bailey	Qualified by 1R6
130.	99	A031	PDT1034	Bailey	Qualified by 1R6
131.	99	A032	PDT1035	Bailey	Qualified by 1R6
132.	99	A033	PDT1036	Bailey	Qualified by 1R6
133.	99	A034	PDT1037	Bailey	Qualified by 1R6
134.	100	B084	PDT1401	Bailey	Qualified by 1R6
135.	101	B085	PDT1402	Bailey	Qualified by 1R6
136.	101	B074	PDT1228	Bailey	Qualified by 1R6
137.	101	B075	PDT1230	Bailey	Qualified by 1R6
138.	101	B067	PDT1209	Bailey	Qualified by 1R6
139.	101	B068	PDT1210	Bailey	Qualified by 1R6
140.	102	A016	LT1001	Bailey	Qualified by 1R6
141.	103	A018	LT1002	Bailey	Qualified by 1R6
142.	104	A014	LT1000	Bailey	Qualified by 1R6
143.	105	A006	LT2664	Bailey	Qualified by 1R6
144.	105	A005	LT2659	Bailey	Qualified by 1R6
145.	106	A001	LT2609	Bailey	Qualified by 1R6
146.	106	A002	LT2614	Bailey	Qualified by 1R6
147.	108	A025	PT1022	Foxboro	Qualified by 1R6
148.	108	A037	PT1040	Foxboro	Qualified by 1R6
149.	109	A063	PT2406	Fisher & Porter	Qualified by 1R6
150.	110	A064	PT2407	Fisher & Porter	Qualified by 1R6
151.	110	A062	PT2405	Fisher & Porter	Qualified by 1R6
152.	111	A026	PT1023	Rosemount	Qualified by 1R6
153.	112	A023	PT1020	Foxboro	Qualified by 1R6

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
154.	113	A036	PT1039	Rosemount	Qualified by 1R6
155.	113	A035	PT1038	Rosemount	Qualified by 1R6
156.	113	A024	PT1021	Rosemount	Qualified by 1R6
157.	115	B018	VUCM1B	Allis Chalmers	Qualified
158.	115	B017	VUCM1A	Allis Chalmers	Qualified
159.	116	B020	VUCM1D	Allis Chalmers	Qualified
160.	116	B019	VUCM1C	Allis Chalmers	Qualified
161.	117	B022	VUCM7B	Louis Allis	Qualified
162.	118	B021	VUCM7A	Louis Allis	Qualified
163.	118	B023	VUCM7C	Louis Allis	Qualified
164.	119	B124	VEFM37B	G.E.	Qualified
165.	119	B122	VSFM30B	G.E.	Qualified
166.	120	B123	VEFM37A	G.E.	Qualified
167.	120	B121	VSFM30A	G.E.	Qualified
168.	121	B119	CM19A	Reliance	Qualified by 1R6
169.	122	B120	CM19B	Reliance	Qualified by 1R6
170.	123	A069	VSFM1A	Reliance	Qualified
171.	123	A070	VSFM1B	Reliance	Qualified
172.	123	A071	VSFM1C	Reliance	Qualified
173.	123	A072	VSFM1D	Reliance	Qualified
174.	124	B151	VEFM38A	Westinghouse	Qualified
175.	124	B152	VEFM38B	Westinghouse	Qualified
176.	125	B064	PM36B	Westinghouse	Qualified
177.	126	B109	PM35A	Westinghouse	Qualified
178.	127	B080	PM34A	Westinghouse	Qualified
179.	128	B065	PM36C	Westinghouse	Qualified

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
180.	128	B063	PM36A	Westinghouse	Qualified
181.	129	B081	PM34B	Westinghouse	Qualified
182.	129	B110	PM35B	Westinghouse	Qualified
183.	130	C001	VBE1000A	Endevco	Qualified
184.	130	C002	VBE1000B	Endevco	Qualified
185.	130	C005	VBE1001A	Endevco	Qualified
186.	130	C006	VBE1001B	Endevco	Qualified
187.	130	C009	VBE1002A	Endevco	Qualified
188.	130	C010	VBE1002B	Endevco	Qualified
189.	131	B117	VEH6A	Penwalt	Qualified
190.	132	B118	VEH6B	Penwalt	Qualified
191.	133	B125	C178	Comsip Delphi	Qualified by 1R6
192.	134	B126	C179	Comsip Delphi	Qualified by 1R6
193.	135	C003	VBY1000A	TEC	Qualified (2)
194.	135	C004	VBY1000B	TEC	Qualified (2)
195.	135	C007	VBY1001A	TEC	Qualified (2)
196.	135	C008	VBY1001B	TEC	Qualified (2)
197.	135	C011	VBY1002A	TEC	Qualified (2)
198.	135	C012	VBY1002B	TEC	Qualified (2)
199.	137	C017	RE8060	General Atomic	Qualified
200.	137	C018	RE8061	General Atomic	Qualified
201.	138	C016	GEN1008	Endevco	Qualified
202.	140	A105	GEN1010	Okonite	Qualified
203.	142	A100	GEN1003	Conax	Qualified
204.	143	A101	GEN1004	Conax	Qualified
205.	144	A102	GEN1005	Conax	Qualified

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
206.	145	A103	GEN1006	Conax	Qualified
207.	146	A099	GEN1002	Boston Insul. Wire	Qualified
208.	148	C015	GEN1007	Endevco	Qualified
209.	150	B114	SV1818	Target Rock	Qualified (2)
210.	151	B150	SV7503	Target Rock	Qualified (2)
211.	151	B148	SV7502	Target Rock	Qualified (2)
212.	151	B146	SV7501	Target Rock	Qualified (2)
213.	151	B144	SV7500	Target Rock	Qualified (2)
214.	152	B091	SV1428	ASCO	Qualified (2)
215.	153	B092	SV1429	ASCO	Qualified (2)
216.	154	B175	CV2133	ITT General	Qualified (2)
217.	154	B169	CV2123	ITT General	Qualified (2)
218.	154	B177	CV2136	ITT General	Qualified (2)
219.	154	B171	CV2126	ITT General	Qualified (2)
220.	Not Stated	None	GENXXXX	G.E.	Qualified by 1R6
(Terminal Blks)					
221.	Not Stated	None	GENXXXX	Buchannon	Qualified by 1R6
(Terminal Blks)					
222.	114	A077	SV-7410	Reliance	Qualified by 1R6
223.	114	A079	SV-7411	Reliance	Qualified by 1R6
224.	114	A081	SV-7412	Reliance	Qualified by 1R6
225.	114	A083	SV-7413	Reliance	Qualified by 1R6
226.	73	A074	ZS-7407	G.E.	Qualified by 1R6
227.	73	A076	ZS-7409	G.E.	Qualified by 1R6
228.	73	A078	ZS-7410	G.E.	Qualified by 1R6

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
229.	73	A080	ZS-7411	G.E.	Qualified by 1R6
230.	73	A082	ZS-7412	G.E.	Qualified by 1R6
231.	73	A084	ZS-7413	G.E.	Qualified by 1R6
232.	73	A085	ZS-7420-2	G.E.	Qualified by 1R6
233.	73	A086	ZS-7421-2	G.E.	Qualified by 1R6
234.	73	A087	ZS-7422-2	G.E.	Qualified by 1R6
235.	73	A088	ZS-7423-2	G.E.	Qualified by 1R6
236.	73	A090	ZS-7425	G.E.	Qualified by 1R6
237.	73	A092	ZS-7427	G.E.	Qualified by 1R6
238.	NA	NA	SV-7454	Target Rock	Qualified ⁽²⁾
239.	NA	NA	SV-7456	Target Rock	Qualified ⁽²⁾
240.	NA	NA	SV-7457	Target Rock	Qualified ⁽²⁾
241.	NA	NA	SV-7459	Target Rock	Qualified ⁽²⁾
242.	NA	NA	SV-7467	Target Rock	Qualified ⁽²⁾
243.	NA	NA	SV-7469	Target Rock	Qualified ⁽²⁾
244.	NA	NA	SV-7510	Target Rock	Qualified ⁽²⁾
245.	NA	NA	SV-7512	Target Rock	Qualified ⁽²⁾
246.	NA	NA	PT-2618A	Rosemount	Qualified ⁽²⁾ add at 1R6
247.	NA	NA	PT-2618B	Rosemount	Qualified ⁽²⁾ add at 1R6
248.	NA	NA	PT-2668A	Rosemount	Qualified ⁽²⁾ add at 1R6
249.	NA	NA	PT-2617A	Rosemount	Qualified ⁽²⁾ add at 1R6
250.	NA	NA	PT-2617B	Rosemount	Qualified ⁽²⁾

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
					add at 1R6
251.	NA	NA	PT-2667A	Rosemount	Qualified ⁽²⁾
					add at 1R6
252.	NA	NA	PT-2667B	Rosemount	Qualified ⁽²⁾
					add at 1R6
253.	NA	NA	LT-2620	Rosemount	Qualified ⁽²⁾
					add at 1R6
254.	NA	NA	LT-2624	Rosemount	Qualified ⁽²⁾
					add at 1R6
255.	NA	NA	LT-2670	Rosemount	Qualified ⁽²⁾
					add at 1R6
256.	NA	NA	LT-2674	Rosemount	Qualified ⁽²⁾
					add at 1R6
257.	NA	NA	LT-2669	Rosemount	Qualified ⁽²⁾
					add at 1R6
258.	NA	NA	LT-2673	Rosemount	Qualified ⁽²⁾
					add at 1R6
259.	NA	NA	LT-2619	Rosemount	Qualified ⁽²⁾
					add at 1R6
260.	NA	NA	LT-2623	Rosemount	Qualified ⁽²⁾
					add at 1R6
261.	NA	NA	LT-2618	Rosemount	Qualified ⁽²⁾
					add at 1R6
262.	NA	NA	LT-2622	Rosemount	Qualified ⁽²⁾
					add at 1R6
263.	NA	NA	LT-2668	Rosemount	Qualified ⁽²⁾

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
					add at 1R6
264.	NA	NA	LT-2672	Rosemount	Qualified ⁽²⁾
					add at 1R6
265.	NA	NA	LT-2667	Rosemount	Qualified ⁽²⁾
					add at 1R6
266.	NA	NA	LT-2671	Rosemount	Qualified ⁽²⁾
					add at 1R6
267.	NA	NA	LT-2617	Rosemount	Qualified ⁽²⁾
					add at 1R6
268.	NA	NA	LT-2621	Rosemount	Qualified ⁽²⁾
					add at 1R6
269.	25	B076	CV-1234	Limitorque	Qualified
270.	49	B153	SV-2100	Asco	Qualified ⁽³⁾
271.	49	B155	SV-2101	Asco	Qualified ⁽³⁾
272.	43	B157	SV-2102	Asco	Qualified ⁽³⁾
273.	41	B159	SV-2103	Asco	Qualified ⁽³⁾
274.	49	B161	SV-2104	Asco	Qualified ⁽³⁾
275.	49	B163	SV-2105	Asco	Qualified ⁽³⁾
276.	49	B165	SV-2106	Asco	Qualified ⁽³⁾
277.	42	B115	SV-1845	Asco	Qualified ⁽³⁾
278.	50	B050	SV-4804	Asco	Qualified ⁽³⁾
279.	51	B048	SV-4400	Asco	Qualified ⁽³⁾
280.	52	B058	SV-1052	Asco	Qualified ⁽³⁾
281.	70	B158	ZS-2100	Namco	Qualified ⁽³⁾

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
282.	70	B156	ZS-2101	Namco	Qualified (3)
283.	70	B154	ZS-2102	Namco	Qualified (3)
284.	70	B160	ZS-2103	Namco	Qualified (3)
285.	70	B162	ZS-2104	Namco	Qualified (3)
286.	70	B164	ZS-2105	Namco	Qualified (3)
287.	70	B166	ZS-2106	Namco	Qualified (3)
288.	75	B116	ZS-1845	Microswitch	Qualified (3)
289.	80	B051	ZS-4804	Microswitch	Qualified (3)
290.	71	B049	ZS-4400	Namco	Qualified (3)
291.	79	B059	ZS-1052	Microswitch	Qualified (3)
292.	73	A073	ZS-7406	GE	Qualified by 1R6
293.	73	A075	ZS-7408	GE	Qualified by 1R6
294.	73	A089	ZS-7424	GE	Qualified by 1R6
295.	73	A091	ZS-7426	GE	Qualified by 1R6
296.	73	A085	ZS-7420-1	GE	Qualified by 1R6
297.	73	A086	ZS-7421-1	GE	Qualified by 1R6
298.	73	A087	ZS-7422-1	GE	Qualified by 1R6
299.	73	A088	ZS-7423-1	GE	Qualified by 1R6
300.	NA	NA	HS-7435	GE	Qualified by 1R6
301.	NA	NA	HS-7436	GE	Qualified by 1R6
302.	NA	NA	HS-7437	GE	Qualified by 1R6
303.	NA	NA	HS-7438	GE	Qualified by 1R6

<u>No.</u>	<u>FRC Item</u>	<u>Scew</u>	<u>Tag No.</u>	<u>Manufacturer</u>	<u>Remarks</u>
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NOTES:

- (1) AP&L has requested an extension to the qualification deadline for this item.
- (2) These items are considered qualified in conjunction with specific actions under AP&L's maintenance and surveillance program.
- (3) These devices are qualified by a systems review which demonstrates they perform their function prior to exposure to a harsh environment.

ENCLOSURE III

ARKANSAS NUCLEAR ONE
UNIT 1

JUSTIFICATIONS FOR CONTINUED
OPERATION FOR ENVIRONMENTAL
QUALIFICATION DEFICIENCIES

JUNE 1, 1984

ANO-1

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EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer

TAG NO(S): C-178

SER RESPONSE PAGE NO(S): B125

FRC EQUIPMENT ITEM: 133

MANUFACTURER AND MODEL NO.: Delphi BIA-1A1B9D

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

• SAFETY FUNCTION:

The safety function of the hydrogen analyzer is to determine the hydrogen concentration in the Reactor Building after a LOCA.

• QUALIFICATION DISCREPANCY:

According to Franklin, the documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

The qualification discrepancies for the hydrogen analyzer result from a HELB outside containment. Since this system needs to operate only after a LOCA, the required safety function of the hydrogen analyzer is not jeopardized.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 8.8 E5 rads to this component must be considered.

The dose mentioned would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until significant purging has taken place. Since the capability of the purge system to remove hydrogen is well documented, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to significant doses and would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

AP&L recognizes the need to demonstrate full qualification for this device; therefore, this device will be relocated to a mild environment by the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer

TAG NO(S): C-179

SER RESPONSE PAGE NO(S): B126

FRC EQUIPMENT ITEM: 134

MANUFACTURER AND MODEL NO.: Delphi BIA-1A1B9D

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 79

• SAFETY FUNCTION:

The safety function of the hydrogen analyzer is to determine the hydrogen concentration in the Reactor Building after a LOCA.

• QUALIFICATION DISCREPANCY:

According to FRC, the documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

The qualification discrepancies except for radiation occur during a HELB outside Reactor Building. Since this system has no safety related operation during a HELB event, failure during this event does not jeopardize plant safety.

The discrepancy due to radiation results from the one year integrated dose of 5×10^5 rads that the hydrogen analyzer was determined to receive from recirculation of LOCA fluids.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an additional exposure of $1.4 \text{ E}5$ rads to this component must be considered. This dose would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until significant purging has taken place. Since the capability of the purge system to remove hydrogen is well documented, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to any accident doses and would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

AP&L recognizes the need to demonstrate full qualification for this device; therefore, this device will be relocated to a mild environment during the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer Gas Sample Blower

TAG NO(S).: CM-19A

SER RESPONSE PAGE NO(S).: B119

FRC EQUIPMENT ITEM: 121

MANUFACTURER AND MODEL NO.: Reliance 708933-DY

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 46

• SAFETY FUNCTION:

CM-19A is the lead hydrogen analyzer gas sample blower. This blower provides the suction required to obtain a sample of the Reactor Building atmosphere for the hydrogen analyzing system. CM-19A is manually controlled.

• QUALIFICATION DISCREPANCY:

According to FRC, the documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

The qualification discrepancies for CM-19A result from a HELB outside the Reactor Building. Since the hydrogen gas sampling system needs to operate only after a LOCA, the required safety function of CM-19A is not jeopardized.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 8.8 E5 rads to this component must be considered.

The dose mentioned would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until significant purging has taken place. Since the capability of the purge system to remove hydrogen is well documented, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to significant doses and would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

AP&L recognizes the need to demonstrate full qualification for this device; therefore, this device will be relocated to a mild environment by the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Analyzer Gas Sample Blower

TAG NO(S): CM-19B

SER RESPONSE PAGE NO(S): B120

FRC EQUIPMENT ITEM: 122

MANUFACTURER AND MODEL NO.: Reliance 708933-DY

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Room 79

• SAFETY FUNCTION:

CM-19B is the stand-by hydrogen analyzer gas sample blower. This blower provides the suction required to obtain a sample of the Reactor Building atmosphere for the hydrogen analyzing system. CM-19B is manually controlled.

• QUALIFICATION DISCREPANCY:

According to FRC, the documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

All the qualification discrepancies for CM-19B, except for the one resulting from radiation, result from a HELB outside of the Reactor Building. Since the hydrogen gas sampling system needs to operate only after a LOCA, the required safety operation of CM-19B is not jeopardized due to a HELB.

The discrepancy due to radiation results from the 30-day integrated dose to CM-19B from recirculation of LOCA fluids of 5×10^5 rads.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an additional exposure of $1.4 \text{ E}5$ rads to this component must be considered. This dose would not be present at the beginning of purge operations; therefore, the ability to monitor H_2 concentration is not compromised until significant purging has taken place. Since the capability of the purge system to remove hydrogen is well documented, once purging has begun the rate of H_2 concentration decrease can be approximated. If the effectiveness of H_2 sampling (accuracy) later became suspect, the redundant sampler could be utilized. This backup sampler would not have been exposed to accident doses and

would therefore be reliable. In addition, ANO has the capability to hook up to external recombiners if necessary.

AP&L recognizes the need to demonstrate full qualification for this device, therefore, this device will be relocated to a mild environment by the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S): CV-1054

SER RESPONSE PAGE NO(S): A045

FRC EQUIPMENT ITEM: 5

MANUFACTURER AND MODEL NO.: Limitorque SMB-000-2

SYSTEM - P&ID NO.: Reactor Coolant, M-230

LOCATION: Reactor Building

• SAFETY FUNCTION:

Isolate Quench Tank Vent Sample Line Upon Receipt of a Safeguards Actuation Signal (Reactor Building Isolation)

• QUALIFICATION DISCREPANCY:

All Items

• JUSTIFICATION FOR CONTINUED OPERATION:

This valve is used for sampling in support of coolant chemistry control and is normally closed during plant operation. If the valve should be open when a LOCA occurs, it would complete its safety function within less than one minute by closing automatically from an engineered safeguards actuation signal. During this time, the actuator would not be exposed to the effects of chemical spray, since 35 seconds are required to open the reactor building spray valves and deliver design flow from the spray pumps, and 54 seconds are required at design flow to fill the spray line from the isolation valves to the nozzles. The actuator would not be submerged until after it had performed its safety function, and would not be significantly degraded by the brief initial exposure to the accident environment.

Once closed, the motor leads are de-energized and the "open" portion of the control circuit is not affected by any postulated failure of the actuator limit switches. Therefore, no failure mode can be postulated at the actuator that would spuriously open the valve.

In addition, a redundant isolation valve, CV-1845, located outside the reactor building provides a redundant isolation function. CV-1054 is qualified for 250°F, 25 psia and 2×10^7 rads, however, since it was not explicitly designed for use inside containment, AP&L is replacing the existing actuator for CV-1054 with an actuator demonstrated to be fully qualified for use inside containment.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION

ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S).: CV-2215

SER RESPONSE PAGE NO(S).: A056

FRC EQUIPMENT ITEM: 1

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-234, Intermediate Cooling System

LOCATION: Reactor Building

• SAFETY FUNCTION:

Letdown Coolers Isolation

• QUALIFICATION DISCREPANCY:

According to the Franklin "Technical Evaluation Report" (TER), qualification of these devices is deficient in the following areas: Similarity to test specimen not established and aging (qualified life) not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device. We have not been able to obtain information by walkdown (motor manufacturer and insulation class) needed to assure qualification due to missing motor nameplates. The applicable test report for the remainder of the actuator is 600198. Although, purchase documentation indicates a Class H motor and visual inspections indicate the motors are probably identical to other fully qualified motors, AP&L has chosen to replace the motors with fully qualified substitutes.

This valve, required for isolation, would complete its safety function within less than one minute by closing automatically from an engineered safeguards actuation signal. During this time, the actuator would not be exposed to the effects of chemical spray, since 35 seconds are required to open the reactor building spray valves and deliver design flow from the spray pumps, and 54 seconds are required at design flow to fill the spray line from the isolation valves to the nozzles. The actuator would not be

significantly degraded by the brief initial exposure to the accident environment.

Once closed, the motor leads are de-energized and the "open" portion of the control circuit is not affected by any postulated failure of the actuator limit switches. Therefore, no failure mode can be postulated at the actuator that would spuriously open the valve.

In addition, a redundant isolation valve, CV-2214, located outside the reactor building provides a redundant isolation function and is fully qualified for its applicable accident environment.

Once motor replacement is completed, the device satisfies all Aging requirements per Limitorque report B0058.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Motor Operated Valve

TAG NO(S): CV-2221

SER RESPONSE PAGE NO(S): A057

FRC EQUIPMENT ITEM: 1

MANUFACTURER AND MODEL NO.: Limitorque Model SMB-00

SYSTEM - P&ID NO.: M-234, Intermediate Cooling System

LOCATION: Reactor Building

• SAFETY FUNCTION:

Control Rod Drive/Reactor Coolant Pump Coolant Isolation

• QUALIFICATION DISCREPANCY:

According to the Franklin "Technical Evaluation Report" (TER), qualification of these devices is deficient in the following areas: Similarity to test specimen not established and aging (qualified life) not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

This device has been established by Limitorque as identical or similar to one previously tested. Franklin was unable to establish the similarity without the documentation provided to AP&L by Limitorque. In reconfirming the application of test reports to specific devices, AP&L determined a lack of complete documentation to establish full qualification for the motor supplied with this device. We have not been able to obtain information by walkdown (motor manufacturer and insulation class) needed to assure qualification. The applicable test report for the remainder of the actuator is 600198.

Although documentation indicates a class H motor and visual inspections indicate the motors are probably identical to other fully qualified motors, AP&L has chosen to replace the motors with fully qualified substitutes.

This valve, required for isolation, would complete its safety function within less than one minute by closing automatically from an engineered safeguards actuation signal. During this time, the actuator would not be exposed to the effects of chemical spray, since 35 seconds are required to open the reactor building spray valves and deliver design flow from the spray pumps, and 54 seconds are required at design flow to fill the spray line from the isolation valves to the nozzles. The actuator would not be

significantly degraded by the brief initial exposure to the accident environment.

Once closed, the motor leads are de-energized and the "open" portion of the control circuit is not affected by any postulated failure of the actuator limit switches. Therefore, no failure mode can be postulated at the actuator that would spuriously open the valve.

In addition, a redundant isolation valve, CV-2220, located outside the reactor building provides a redundant isolation function and is fully qualified for its applicable accident environment.

Once motor replacement is completed, the device satisfies all Aging requirements per Limitorque report B0058.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Service Water Supply to Decay Heat Unit Cooler Control Valve

TAG NO(S).: CV-3800

SER RESPONSE PAGE NO(S).: B024

FRC EQUIPMENT ITEM: 40

MANUFACTURER AND MODEL NO.: Rotork 6A

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 11

• SAFETY FUNCTION:

CV-3800 is required to open to supply service water to auxiliary building decay heat removal unit cooler VUC1D, on either manual actuation or automatic actuation as backup to VUC1C.

• QUALIFICATION DISCREPANCY:

Due to a previous erroneous room location, a discrepancy due to high temperature existed.

• JUSTIFICATION FOR INTERIM OPERATION:

This device was originally shown to be located in room 53; however, it has since been determined to be in room 11 where the maximum temperature is 111°F from an HELB. This device is not required to mitigate any HELB's which create a harsh environment in room 11. In any case, this actuator is fully qualified to the worst case conditions for room 11; therefore, a justification for continued operation is actually not needed.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Service Water Supply Valve to Decay Heat Unit Cooler

TAG NO(S): CV-3801

SER RESPONSE PAGE NO(S): B025

FRC EQUIPMENT ITEM: 40

MANUFACTURER AND MODEL NO.: Rotork 6A

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 14

• SAFETY FUNCTION:

CV-3801 is required to open to supply service water to auxiliary building decay heat removal unit cooler VUC1B, on either manual actuation or automatic actuation occurring upon failure of primary cooler VUC1A.

• QUALIFICATION DISCREPANCY:

Due to a previous mistaken room identification, a discrepancy due to temperature existed.

• JUSTIFICATION FOR INTERIM OPERATION:

This device was originally shown to be located in room 53; however, it has since been determined to be in room 14 where the maximum temperature is 111°F from an HELB. This device is not required to mitigate any HELB's which create a harsh environment in room 14. In any case, this actuator is fully qualified to the worst case conditions for room 14; therefore, a justification for continued operation is actually not needed.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Service Water Supply to Decay Heat Cooler Control Valve

TAG NO(S): CV-3802

SER RESPONSE PAGE NO(S): B026

FRC EQUIPMENT ITEM: 40

MANUFACTURER AND MODEL NO.: Rotork 6A

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 11

• SAFETY FUNCTION:

CV-3802 is required to open to supply service water to auxiliary building decay heat removal unit cooler VUC1C, on either manual actuation or automatic actuation when decay heat removal pump 34A or 34B is started.

• QUALIFICATION DISCREPANCY:

Due to a previous erroneous room location, a discrepancy due to temperature existed.

• JUSTIFICATION FOR INTERIM OPERATION:

This device was originally shown to be located in room 53; however, it has since been determined to be in room 11 where the maximum temperature is 111°F from an HELB. This device is not required to mitigate any HELB's which create a harsh environment in room 11. In any case, this actuator is fully qualified to the worst case conditions for room 14; therefore, a justification for continued operation is actually not needed.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Service Water Supply to Decay Heat Unit Cooler Control Valve

TAG NO(S): CV-3803

SER RESPONSE PAGE NO(S): B027

FRC EQUIPMENT ITEM: 35

MANUFACTURER AND MODEL NO.: Rotork 6A

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 14

• SAFETY FUNCTION:

CV-3803 is required to open to supply service water to auxiliary building decay heat removal unit cooler VUC1A, on either manual actuation or automatic actuation when decay heat removal pump 34A or 34B is started.

• QUALIFICATION DISCREPANCY:

Due to a previous erroneous room location, a discrepancy due to temperature existed.

• JUSTIFICATION FOR INTERIM OPERATION:

This device was originally shown to be located in room 57; however, it has since been determined to be in room 14 where the maximum temperature is 111°F from an HELB. This device is not required to mitigate any HELB's which create a harsh environment in room 14. In any case, this actuator is fully qualified to the worst case conditions for room 14; therefore, a justification for continued operation is actually not needed.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Service Water Supply Control Valve, Including Position Switch, to Make Up Pump Lube Oil and Room Coolers

TAG NO(S): CV-3808

SER RESPONSE PAGE NO(S): B032

FRC EQUIPMENT ITEM: 36

MANUFACTURER AND MODEL NO.: Rotork 6A

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 56

• SAFETY FUNCTION:

CV-3808 is required to open to provide service water to the makeup pump lube oil and room coolers. The valve opens automatically when Makeup Pump P36A starts, or can be opened manually.

• QUALIFICATION DISCREPANCY:

The specified temperature is 178°F, and the valve is qualified for 163°F.

• JUSTIFICATION FOR INTERIM OPERATION:

CV-3808 is exposed to a harsh environment due to a reactor coolant letdown line break. The temperature and pressure profiles for this break reveal that the duration of the temperature spike above the qualified temperature for CV-3808 is approximately 90 seconds. The valve's safety function will be accomplished within 25 seconds (FSAR Sec. 6.1.3.1). CV-3808 is qualified for continuous operation at 163°F. Although the surface temperature of the valve and actuator might reach thermal equilibrium with the environment within 25 seconds, the internal components of the valve and actuator would be expected to remain at a substantially lower temperature due to the thermal inertia of the valve and actuator housings, based on engineering judgement. No failure mode has been identified which would cause this valve to close once it has opened since electrical power is supplied from a remotely located motor control center.

Only one HPI pump is required to mitigate a letdown line break (reference FSAR Section 14.2.2.5.4.3). Since one HPI pump is lined up for normal operation, its associated service water valve (CV-3808, CV-3809, or CV-3810) is already open as required. Therefore, the safety function is assured.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION

ANO-1

COMPONENT: Service Water Supply to Makeup Pump Lube Oil and Room Coolers
Control Valve and Internal Position Switch

TAG NO(S): CV-3809

SER RESPONSE PAGE NO(S): B033

FRC EQUIPMENT ITEM: 34

MANUFACTURER AND MODEL NO.: Rotork 6A

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 55

• SAFETY FUNCTION:

CV-3809 is required to open to provide service water to the makeup (M.U.) pump lube oil and room coolers. The valve opens automatically when M.U. pump P-36B starts, or manually upon HS-3809 open signal.

• QUALIFICATION DISCREPANCY:

Qualification documentation does not envelope the environmental parameters for the following:

Temperature: 178°F

• JUSTIFICATION FOR INTERIM OPERATION:

CV-3809 is exposed to a harsh environment due to a reactor coolant letdown line break. The temperature and pressure profiles for this break reveal that the duration of the temperature spike above the qualified temperature for CV-3809 is approximately 30 seconds. The valve's safety function will be accomplished within 25 seconds (FSAR Sec. 6.1.3.1). CV-3809 is qualified to operate continuously at 163°F. Although the surface temperature of the valve and actuator might reach thermal equilibrium with the environment within 25 seconds, engineering judgement indicates that the internal components of the valve and actuator would remain at a substantially lower temperature due to the thermal inertia of the valve and actuator housings. Successfully achieving safe shutdown will be assured by two additional trains, only one of which is required to mitigate the initiating event.

Only one HPI pump is required to mitigate a letdown line break (reference FSAR Section 14.2.2.5.4.3). Since one HPI pump is lined up for normal operation, its associated service water valve (CV-3808, or CV-3810), is already open as required. Therefore, the safety function is assured.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Service Water Supply Control Valve, Including Position Switch, To Makeup Pump Lube Oil and Room Coolers

TAG NO(S).: CV-3810

SER RESPONSE PAGE NO(S).: B034

FRC EQUIPMENT ITEM: 36

MANUFACTURER AND MODEL NO.: Rotork 6A

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 54

• SAFETY FUNCTION:

CV-3810 is required to open to provide service water to the makeup pump lube oil and room coolers. The valve opens automatically when Makeup Pump P-36B starts, or can be manually opened.

• QUALIFICATION DISCREPANCY:

The specified temperature is 178°F, and the valve is qualified for 163°F.

• JUSTIFICATION FOR INTERIM OPERATION:

CV-3810 is exposed to a harsh environment due to a reactor coolant letdown line break. The temperature and pressure profiles for this break reveal that the duration of the temperature spike above the qualified temperature for CV-3810 is approximately 90 seconds. The valve's safety function will be accomplished within 25 seconds (FSAR Sec. 6.1.3.1). CV-3810 is qualified for continuous operation at 163°F. Although the surface temperature of the valve and actuator might reach thermal equilibrium with the environment within 25 seconds, the internal components of the valve and actuator would be expected to remain at a substantially lower temperature due to the thermal inertia of the valve and actuator housings, based on engineering judgement. No failure mode has been identified which would cause this valve to close once it has opened since power is supplied from a remotely located motor control center.

Only one HPI pump is required to mitigate a letdown line break (reference FSAR Section 14.2.2.5.4.3). Since one HPI pump is lined up for normal operation, its associated service water valve (CV-3808, CV-3809, or CV-3810), is already open as required. Therefore, the safety function is assured.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Terminal Blocks

TAG NO(S).: GEN-XXXX

SER RESPONSE PAGE NO(S).: NA

FRC EQUIPMENT ITEM: NA

MANUFACTURER AND MODEL NO.: General Electric EB-5 and EB-25 or Buchannon Model B106

SYSTEM - P&ID NO.: NA

LOCATION: Reactor Building and Auxiliary Building

• SAFETY FUNCTION:

Terminal blocks are used to make termination of various lead wires from certain electrical components. In any particular application, the function of the terminal block is considered integral with the function of the device it is connected to.

• QUALIFICATION DISCREPANCY:

These items have not been specifically identified in previous submittals; therefore, inadequate documentation of qualification has been provided.

• JUSTIFICATION FOR INTERIM OPERATION:

AP&L has determined all probable locations of terminal blocks which are associated with devices on the EQ list, both inside and outside containment. A walkdown of the devices inside containment confirmed the use of GE terminal blocks in a few cases. In each of these cases, however, the associated device (transmitter) is being replaced and a JCO has been submitted. The JCO logic for the transmitter is considered applicable to the terminal block as well. All terminal blocks inside containment associated with EQ devices will be replaced with qualified Raychem splices.

According to a recent evaluation of terminal blocks located outside containment, only twelve EQ devices have associated terminal blocks. Of these, six are required to function only in a harsh radiation environment. The GE EB-25 and EB-5 and the Buchannon B106 are considered qualified for the applicable radiation dose by type tests and material analyses.

Of the remaining six, two terminal blocks are associated with devices for which JCO's have been written; therefore, no additional justification is required. The other four blocks are associated with the EFW flow transmitters. The transmitters are fully qualified Rosemount 1153 D's. The blocks are located in room 79 and 46. They are located in Nema 4 terminal boxes with gasketed, sealed doors to prevent moisture intrusion. In addition, the peak pressure in both rooms is less than 1.1 psig which is not expected to defeat the integrity of terminal boxes containing the blocks. The two line breaks which create a harsh environment for these blocks are the reactor coolant letdown line break (RCLB) and the main feedwater line break (MFW). The RCLB does not create a harsh environment for the blocks associated with steam generator B, and the MFW line break does not affect the transmitters associated with steam generator A; therefore, flow indication will be available for at least one generator for either break.

Also, even if the blocks experience leakage currents affecting the accuracy of the flow indication, this is not considered critical to accident mitigation because steam generator control is based primarily on level control and primary system response. Therefore, as long as the flow indication can supply trending information (i.e., increasing or decreasing flow), the primary function is assured. In any case, these blocks will be replaced with Raychem splices by the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Pressurizer Level Transmitters

TAG NO(S): LT-1000, LT-1001, LT-1002

SER RESPONSE PAGE NO(S): A014, A016, A018

FRC EQUIPMENT ITEM: 102, 103, 104

MANUFACTURER AND MODEL NO.: Bailey BY-3X40X-A

SYSTEM - P&ID NO.: Reactor Coolant System M-230

LOCATION: Reactor Building

• SAFETY FUNCTION:

These level transmitters are responsible for generating the signals required for the pressurizer level indicators located in the control room.

• QUALIFICATION DISCREPANCY:

These transmitters are subjected to a chemical spray of 15,000 ppm Boric Acid (pH 10.5) at 77°F. No documentation exists to qualify the operation of these transmitters in this environment. In addition, the transmitters were not tested to the required radiation level of 5×10^7 rads.

• JUSTIFICATION FOR INTERIM OPERATION:

The casings for these transmitters are constructed of #316 stainless steel, and are classified as NEMA 7D Hazardous Locations enclosures. Operation of the transmitters is required for 24 hours after the initiation of a LOCA. The harsh boric acid environment would not be expected to jeopardize the proper functioning of the transmitters during this time period. Since each of these transmitters is independent from the others, failure of up to two of the transmitters can occur without causing loss of pressurizer level indication in the control room.

These instruments are for monitoring only and perform no automatic or trip functions. They perform no essential functions following a large break LOCA since the pressurizer empties. Therefore, chemical spray is of little concern in this case.

For a steam line break, the radiation source term is considered negligible. The only design basis event of concern is a SBLOCA in which pressurizer level is available. For this case, building

pressures sufficient to initiate chemical spray would not be expected. In addition, a small break LOCA is not considered realistically to create an instantaneous source term as postulated for the large break LOCA. Any realistic scenario which could lead to significant radiation source terms would require core uncover which (as in the case of TMI) implies the termination of ECCS systems. Significant training has been conducted on handling of small break LOCA's especially regarding termination of ECCS. In fact, operators are not allowed to terminate HPI following a SBLOCA unless the RCS is subcooled.

Therefore, we believe the existing transmitters are capable of performing their functions under realistic (expected) conditions from all design basis events; however, in order to demonstrate full and clear compliance with existing regulations, these transmitters are being replaced with fully qualified substitutes during the upcoming refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

At any rate, during a SBLOCA, pressurizer level may not be a true indicator of RCS inventory due to steam void formation; this is already pointed out in the ANO-1 emergency procedures.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION

ANO-1

COMPONENT: Steam Generator Secondary Level Transmitter

TAG NO(S): LT-2609, LT-2614, LT-2659, LT-2664

SER RESPONSE PAGE NO(S): A001, A002, A005, A006

FRC EQUIPMENT ITEM: 105, 106

MANUFACTURER AND MODEL NO.: Bailey BY-8B41X-A

SYSTEM - P&ID NO.: Steam Generator Secondary M-206

LOCATION: Reactor Building

• SAFETY FUNCTION:

These components transmit the Once Through Steam Generator (OTSG) secondary level signal to the control room to indicate feedwater delivery to the OTSG and thereby assure proper core heat removal. LT-2664 and LT-2659 indicate level in the low range and the high range, respectively, for OTSG E24A. LT-2614 and LT-2609 are the corresponding components for OTSG E24B.

• QUALIFICATION DISCREPANCY:

These transmitters are subjected to a chemical spray of 15,000 ppm Boric Acid (pH 10.5) at 77°F. No documentation exists to qualify the operation of these transmitters for this environment. In addition, the transmitters were not qualified to the required radiation exposure of 5×10^7 rads.

• JUSTIFICATION FOR INTERIM OPERATION:

The casings for these transmitters are constructed of stainless steel number 316, and are classified as NEMA 7D Hazardous Location enclosures. Based upon engineering judgement, the harsh chemical spray environment would not be expected to damage the instruments and jeopardize proper functioning. Each OTSG is supplied with identical corresponding level transmitters that perform a redundant function on an independent Instrumentation Control System channel. In addition, these transmitters are not essential for a large break LOCA; therefore, the chemical spray consideration is not critical in this case.

For a main steam line break, the radiation source term is negligible. The break of concern, a small break LOCA, is not considered to realistically create an instantaneous radiation source term as postulated for the large break LOCA. Any realistic scenario which

could lead to significant radiation source terms would require core uncover which (as in the case of TMI) implies the termination of ECCS systems. Significant training has been conducted on handling of small break LOCA's, especially regarding termination of ECCS. In fact, operators are not allowed to terminate HPI following a SBLOCA unless the RCS is subcooled.

Therefore, we believe the existing transmitters are capable of performing their functions under realistic (expected) conditions from all design basis events; however, in order to demonstrate full and clear compliance with existing regulations, the functions of these transmitters will be based on fully qualified instruments by the next refueling outage. In fact, AP&L has already installed qualified transmitters which will replace the function of these transmitters when the new EFW control system is declared operational (upcoming refueling outage). The indication from the new transmitters is currently available to the operators as backup to the existing level transmitters in fact, the emergency operating procedures already direct the operators to make use of them for backup.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hot Leg Pressure Differential Transmitters

TAG NO(S).: PDT-1028, PDT-1029, PDT-1030, PDT-1031, PDT-1034, PDT-1035,
PDT-1036, PDT-1037

SER RESPONSE PAGE NO(S).: A027 thru and including A034

FRC EQUIPMENT ITEM: 99

MANUFACTURER AND MODEL NO.: Bailey BY-3X41-A

SYSTEM - P&ID NO.: Reactor Coolant System M-230

LOCATION: Reactor Building

• SAFETY FUNCTION:

There are four Pressure Differential Transmitters (PDT's) on the hot leg of each of two Reactor Coolant System (RCS) loops. Each PDT of Loop A will have a single corresponding PDT on Loop B, and the pair form an input to one of the four Reactor Protection System channels. The flow information derived by these PDT's is monitored by the plant computer and used in conjunction with neutron flux signals to generate the set point for Reactor Power Trip Based on Imbalance and Flow Functions. A two out of four logic is used to generate the trip signal.

• QUALIFICATION DISCREPANCY:

These transmitters are subjected to a chemical spray of 15,000 ppm Boric Acid (pH 10.5) at 77°F. No documentation exists to qualify the operation of these transmitters in this environment. In addition, these transmitters were not tested to the required radiation level of 5×10^7 rads.

• JUSTIFICATION FOR INTERIM OPERATION:

The casings for these transmitters are constructed of #316 stainless steel, and are classified as NEMA 7D Hazardous Location enclosures. The specified operation time for these components is the first eight hours after accident initiation. Based upon this information and engineering judgement, the harsh boric acid environment would not be expected to jeopardize the proper functioning of the transmitters during this time period.

If the transmitters should fail, the protection channel trip relay is de-energized insuring safe operation upon failure.

In addition, these devices are associated with the following RPS trip transients: locked rotor accident, single RC pump coastdown from four pump operation, and underfrequency transients. None of these events involve a harsh environment; therefore, they perform no essential safety functions following a LOCA or HELB and can be considered outside the scope of 10CFR50.49, Section b(1). Since they could have some value to operators as post-accident monitoring equipment (10CFR50.49, Section b(3)), these transmitters are being replaced by the upcoming refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: HPI Loop Flow Measurement Differential Pressure Transmitter

TAG NO(S).: PDT-1209, PDT-1210, PDT-1228, PDT-1230

SER RESPONSE PAGE NO(S).: B067, B068, B074, B075

FRC EQUIPMENT ITEM: 101

MANUFACTURER AND MODEL NO.: Bailey BY-3240X-A

SYSTEM - P&ID NO.: Makeup and Purification M-231

LOCATION: Room 53

• SAFETY FUNCTION:

Measures HPI flow to each reactor coolant loop, provides flow indication and high/low flow alarms in Control Room. During the injection phase following a LOCA, flow indication and throttling of the respective injection MOVs are used to prevent pump cavitation.

• QUALIFICATION DISCREPANCY:

According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

The harsh temperature and pressure environment is caused by a letdown line break. HPI could be required to mitigate the subsequent loss of coolant; however, the break would be automatically isolated on low primary system pressure or would be manually isolated. Since the break size is 4" diameter or less, the HPI pumps would not be expected to runout during the period of time when the break is not isolated. Therefore, the flow measurement is not critical to preventing pump cavitation.

The harsh radiation environment specified is due to post-accident recirculation lines in Room 53; however, the instrument performs its major safety function during the injection phase of the LOCA. During the recirculation phase, the monitoring function is not considered critical.

The Bailey "BY" transmitter has been demonstrated qualified to 60 psig, 275°F, and 2×10^4 rads.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Cooler Flow Measurement
Differential Pressure Transmitter

TAG NO(S).: PDT-1401

SER RESPONSE PAGE NO(S).: B084

FRC EQUIPMENT ITEM: 100

MANUFACTURER AND MODEL NO.: Bailey BY-3240X-A

SYSTEM - P&ID NO.: Decay Heat Removal M-232

LOCATION: Room 14

• SAFETY FUNCTION:

Measure Decay Heat Removal Pump P34A discharge flow during LPI and decay heat removal operation, and provide low flow alarm and indication to the Control Room. Flow is monitored as during the injection phase following a LOCA, and the respective LPI injection MOVs are throttled to prevent pump cavitation.

• QUALIFICATION DISCREPANCY:

According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

Except for radiation, the specified harsh environment is due to a letdown line break outside the reactor building. Although this component is required to mitigate the effects of a letdown line break outside the reactor building (for subsequent decay heat removal), the pressure and temperature conditions caused by the line break are not severe (111°F maximum temperature, 15.7 psia maximum pressure) and will return to normal ambient conditions before decay heat removal system operation is required. Low pressure injection would not be required for mitigating a letdown line break outside the reactor building.

The harsh radiation environment specified is due to post-accident recirculation lines in Room 14; however, the instrument performs its major safety function during the injection phase of the LOCA when no recirculating source exists. During the recirculation phase, the monitoring function is not considered critical.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Cooler Flow Measurement Differential Pressure Transmitter

TAG NO(S).: PDT-1402

SER RESPONSE PAGE NO(S).: B085

FRC EQUIPMENT ITEM: 101

MANUFACTURER AND MODEL NO.: Bailey BY-3240X-A

SYSTEM - P&ID NO.: Decay Heat Removal M-232

LOCATION: Room 10

• SAFETY FUNCTION:

Measure Decay Heat Removal Pump P34B discharge flow during LPI and decay heat removal operation and provide low flow alarm and indication to the Control Room. Flow is monitored during the injection phase following a LOCA, and the respective LPI injection MOVs are throttled to prevent pump cavitation.

• QUALIFICATION DISCREPANCY:

According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

Except for radiation, the specified harsh environment is due to a letdown line break outside the reactor building. Although this component is required to mitigate the effects of a letdown line break outside the reactor building (for subsequent decay heat removal), the pressure and temperature conditions caused by the line break are not severe (111°F maximum temperature, 15.7 psia maximum pressure) and will return to normal ambient conditions before decay heat removal system operation is required. Low pressure injection would not be required for mitigating a letdown line break outside the reactor building.

The harsh radiation environment specified is due to post-accident recirculation lines in Room 10; however, the instrument performs its major safety functions during the injection phase of the LOCA, when no recirculating source exists. During the recirculation phase, the monitoring function is not considered critical.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Spray Pump P35B Flow
Measurement Differential Pressure Transmitter

TAG NO(S).: PDT-2400

SEP RESPONSE PAGE NO(S).: B112

FRC EQUIPMENT ITEM: 98

MANUFACTURER AND MODEL NO.: Bailey BY-8240X-A

SYSTEM - P&ID NO.: Reactor Building Spray and Core Flooding M-236

LOCATION: Room 53

• SAFETY FUNCTION:

Measure RBS Pump P35B discharge flow and provide low flow alarm and indication to Control Room. During the injection phase following a LOCA, flow indication and throttling of the respective spray isolation MOVs is used to prevent pump cavitation.

• QUALIFICATION DISCREPANCY:

According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

This component is required for a LOCA only. Except for radiation, the specified harsh environment is due to a high energy line break outside the reactor building. Therefore, the component is not exposed to harsh conditions (except for radiation).

The harsh radiation environment is due to post-accident recirculation lines in Room 53; however, the instrument performs its major safety function during the injection phase of the LOCA, when no recirculating source exists. During the recirculation phase, the device's monitoring function is not critical.

The primary function of detecting low flow is important as the BWST empties; after suction is switched to RB sump (common with LPI), low flow conditions are not likely. Also, LPI flow indication can provide indications of flow from the sump. Low flow conditions could be caused by failure of specific valve operators or the RBS pump motors themselves; however, these devices are considered fully qualified.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Flow Transmitters

TAG NO(S).: PDT-7441, -7451

SER RESPONSE PAGE NO(S).: B127, B139

FRC EQUIPMENT ITEM: 94

MANUFACTURER AND MODEL NO.: Fischer and Porter 10B2491JC

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 46

• SAFETY FUNCTION:

To measure Hydrogen Purge System flow rate during post-LOCA Hydrogen Purge System operation.

• QUALIFICATION DISCREPANCY:

According to the Franklin Technical Evaluation Report, similarity, aging, accuracy, and operating time were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

The specified harsh environmental conditions (except for radiation) result from a high energy line break; however, these devices would not be required in this case. The LOCA does not create harsh conditions in Room 46. However, these devices could receive a radiation dose due to the close proximity of the hydrogen purge filters which become contaminated during the purge process. The transmitters could receive a dose of 1.5 E6 rads. AP&L has test documentation which indicates that similar Fischer Porter transmitters were tested to levels in excess of 1 E7 rads; however, AP&L has been unable to confirm (or deny) that the installed transmitters are identical in all respects to the tested device.

The worst effect of failure of these components would be:

1. Loss of low flow interlock to the respective purge system heater; heater temperature switches TS-7441A and B could provide backup protection for a high temperature condition should the low flow interlock be unavailable.

2. Spurious trip (false low flow signal) of the purge system heater with normal flow; this event would be detected by the remote indicating lights and if necessary, the spurious trip could be manually overridden. The nature of the purge and filtering process is such that time would be available to perform this action.
3. Loss of correct flow indication; system performance can be inferred from measuring fan load amperes with portable instrumentation, knowing the design parameters of the system.

The hydrogen purge system is manually controlled and is not required to operate until approximately eleven days after a LOCA. If the purge unit failed, the backup train in Room 79 could be utilized which would not have been exposed to the high dose from the filters.

It should be noted that ANO-1 has the capability to hook up to external hydrogen recombiners if necessary.

AP&L recognizes that qualification must be fully demonstrated for this component; therefore, a fully qualified replacement will be installed during the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Hydrogen Purge System Flow Transmitters

TAG NO(S).: PDT-7442, PDT-7452

SER RESPONSE PAGE NO(S).: 8130, B141

FRC EQUIPMENT ITEM: 95

MANUFACTURER AND MODEL NO.: Fischer & Porter 10B2491JC

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 79

• SAFETY FUNCTION:

Measure Hydrogen Purge System flow rate during post-LOCA hydrogen purge system operation.

• QUALIFICATION DISCREPANCY:

According to Franklin, similarity, aging, accuracy, and operating time were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

These devices are needed for a LOCA only. Except for radiation, the specified harsh environment for these components results from an HELB outside reactor building (reactor coolant letdown line break). The hydrogen purge system removes hydrogen from the reactor building after a LOCA.

Radiation exposure for this device due to pipe lines carrying post-accident recirculation fluids routed through Room 79 was determined to be 1.6 E6 rads. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment an additional exposure of 2.3 E5 rads for PDT-7442 and 6.8 E6 rads for PDT-7452 must be considered. AP&L has test documentation indicating that similar transmitters have been qualified to levels in excess of 1 E7 rads; however, AP&L has been unable to confirm (or deny) that the installed transmitters are identical in all respects to the tested device.

The worst effect of failure of these components would be:

1. Loss of low flow interlock to the respective purge system heater; heater temperature switches TS-7442A and B would provide backup protection for a high temperature condition should the low flow interlock be unavailable.
2. Spurious trip (false low flow signal) of the purge system heater with normal flow; this event would be detected by the remote indicating lights, and if necessary, the spurious trip could be manually overridden. The nature of the purge and filtering process is such that time would be available to perform this action.
3. Loss of correct flow indication; system performance can be inferred from measuring fan load amperage with portable instrumentation, knowing the design parameters of the system.

The hydrogen purge system is manually controlled and is not required to operate until approximately eleven days after a LOCA. If the purge system failed, the backup train could be utilized.

It should be noted that ANO-1 has the capability to hook up to external hydrogen recombiners if necessary.

AP&L recognizes that qualification must eventually be fully demonstrated for this component; therefore, a fully qualified replacement will be installed during the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Pressure Switch

TAG NO(S).: PS-2400, PS-2401, PS-2402, PS-2403

SER RESPONSE PAGE NO(S).: A-058, A-059, A-060, A-061

FRC EQUIPMENT ITEM: 85, 86, 87, 88

MANUFACTURER AND MODEL NO.: ITT Barton 288A

SYSTEM - P&ID NO.: Reactor Building Spray and Core Flood M-236

LOCATION: Reactor Building

• SAFETY FUNCTION:

Each of these switches is connected to a separate Reactor Protection System channel and generates a reactor trip signal on high Reactor Building pressure.

• QUALIFICATION DISCREPANCY:

No specific deficiencies were listed by Franklin, pending modification.

• JUSTIFICATION FOR INTERIM OPERATION:

Based on the FSAR the environmental parameters specified for these switches are the calculated results for the design basis LOCA. In such an event, the set point of 4 psig for these switches will be reached in less than one second after break initiation. This time will be well before the peak pressure and temperature conditions are reached in the containment. In addition, the design of these components is such that if they should become damaged, they would be expected to fail in the "trip" (open circuit) position and thereby serve their safety function. A signal from two of the four switches is sufficient to provide reactor trip. There are no monitoring functions associated with these devices. This trip is a backup to the low RC pressure trip which is the main trip for LOCA and MSLB's.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: RCS Loop A & B Hot Leg Pressure Transmitters

TAG NO(S).: PT-1020, PT-1022, PT-1040

SER RESPONSE PAGE NO(S).: A023, A025, A037

FRC EQUIPMENT ITEM: 108 and 112

MANUFACTURER AND MODEL NO.: Foxboro E11GH

SYSTEM - P&ID NO.: Reactor Coolant, M-230

LOCATION: Reactor Building

• SAFETY FUNCTION:

Measure RCS hot leg pressure in Loops A and B and provide input to Engineered Safeguards Actuation System for automatic initiation of Emergency Core Cooling via High Pressure or Low Pressure Injection.

• QUALIFICATION DISCREPANCY:

According to Franklin, similarity, aging, and accuracy were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

Similarity has been established between Model E11GH transmitter installed in ANO-1 and the tested Model E11AH transmitter. Efforts were undertaken to verify that radiation hardened amplifiers qualified to 3.7×10^7 rads are currently installed; this verification would completely qualify the component except for aging and accuracy.

These pressure transmitters are used to initiate an engineered safeguards actuation signal on low reactor coolant system pressure. Once safeguards actuation logic has been initiated, their automatic protective action function is completed within seconds, prior to significant environmental degradation. Although changes in instrument accuracy have been noted in qualification tests, the instrument drift has been in the safe direction; i.e., lower than actual pressure reading. The instrument drift will not occur before these transmitters have completed their protective action. Even without radiation hardened amplifiers, strict limits for accuracy are not considered critical for post accident monitoring.

To date, AP&L has been unable to confirm (or deny) that the installed device contains the hardened amplifiers. AP&L recognizes that the transmitters must be fully qualified; therefore, AP&L will replace the devices by the next refueling outage with fully qualified substitutes.

Based on the validity of the partial test data available on these devices, and AP&L's judgement that the devices would function properly under realistic (expected) accident conditions, justification for continued operation is considered satisfied for these devices (reference 10CFR50.49 section i(2)).

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR INTERIM OPERATION
ANO-1

COMPONENT: Engineered Safeguards Actuation System Reactor Building Pressure Transmitters

TAG NO(S): PT-2405, PT-2406, PT-2407

SER RESPONSE PAGE NO(S): A062, A063, A064

FRC EQUIPMENT ITEM: 109, 110

MANUFACTURER AND MODEL NO.: Fischer and Porter Model No. 50EN1021BCXB

SYSTEM - P&ID NO.: Reactor Building Spray and Core Flooding - M-236

LOCATION: Reactor Building

• SAFETY FUNCTION:

There are three reactor building pressure transmitters which provided inputs to the Engineered Safeguards Actuation System (ESAS). Via a "two out of three" logic the reactor building pressure transmitters provide input to the ESAS for initiation of various safety systems. A high reactor building pressure initiation signal is provided to the high pressure injection (HPI) system and the low pressure injection system (LPI) at 4 psig. An initiation signal is also provided to the reactor building emergency cooling and reactor building isolation at 4 psig. At 30 psig the reactor building spray system is initiated.

• QUALIFICATION DISCREPANCY:

The qualification discrepancy is not adequately defined in the Technical Evaluation Report (TER). The TER cites a failure of the transmitter during LOCA testing. However, the TER fails to note that this failure occurred over 2 hours into the test. This is well beyond the one minute required operating time specified in the referenced AP&L submittal. (Note that operating times of less than one hour are specifically allowed by Item 8 of Generic Letter 82-09 dated April 20, 1982, (ECNA048210). This position is referenced in the Safety Evaluation for Environmental Qualification of Safety-Related Electrical Equipment for ANO-1 dated January 26, 1983, (ECNA018304).)

In addition, the TER cites a proprietary report (unavailable to AP&L). The description of this report is not sufficiently detailed to allow a meaningful review. Specifically, the time to failure is not discussed, nor is the similarity between the test specimen and the installed components established. Also, the relationship between the test environment and that specified for the subject transmitters is not provided.

• JUSTIFICATION FOR INTERIM OPERATION:

As discussed above, the subject transmitters provide an initiation signal for HPI and LPI at 4 psig. However, a redundant initiation signal is provided by low Reactor Coolant Pressure at 1500 psig. Although the high reactor building pressure setpoint is reached first for all LOCAs analysed in the FSAR, no credit is taken for the high reactor building pressure trip (Re: ANO-1 FSAR Section 14.2.2.5.4.4).

In addition the transmitters provide an initiating signal for reactor building isolation at 4 psig. As discussed in AP&L's letter dated April 16, 1979, (ICAN047910) from Mr. D. C. Trimble to Mr. K. V. Seyfrit, in response to IE Bulletin 79-05A diverse reactor building isolation signals were provided to all reactor building isolation valves which are not required to perform an orderly cooldown following an ESAS actuation. This diverse reactor building isolation signal is provided by low RCS pressure (1500 psig).

The high reactor building pressure signal also actuates reactor building emergency cooling (4 psig) and reactor building spray (30 psig). Although, these functions are automatically initiated, no credit is taken for operation of these systems during a LOCA until 300 seconds into the event (Re: ANO-1 FSAR Figure 14-61). The peak reactor building pressure occurs at 20 seconds and the reactor building pressure is in fact decreasing prior to the assumed operation of the reactor building coolers and spray.

Although any delay in actuation of the reactor building coolers and spray could potentially increase reactor building leakage due to prolonged operation at high reactor building pressure, the FSAR offsite dose calculations conservatively assume a leak rate corresponding to peak reactor building pressure exist for 24 hours (Re: ANO-1 FSAR Table 14-49). Based on the above there is sufficient time to assure operator action to initiate reactor building cooling and spray. Accurate indication of reactor building pressure will be available to the operator via two channels of qualified wide range reactor building pressure installed per NUREG-0737 Item II.F.1.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Spray Pump Lube Oil Cooler Inlet Valve

TAG NO(S).: SV-3804

SER RESPONSE PAGE NO(S).: BG28

FRC EQUIPMENT ITEM: 45

MANUFACTURER AND MODEL NO.: ASCO model 8320A108

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 13

• SAFETY FUNCTION:

SV-3804 energizes to open Reactor Building spray pump lube oil cooler E47A inlet valve CV-3804. SV-3804 energizes when pump P35A starts.

• QUALIFICATION:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR INTERIM OPERATION:

With the exception of radiation, environmental parameters causing discrepancies are due to a Reactor Coolant letdown line break outside of the Reactor Building. SV-3804, which opens the Reactor Building spray pump P35A lube oil cooler E47A inlet valve CV-3804, is not required to operate for the specified environmental parameters. SV-3804 is energized off an "A" contact (contact closed when breaker is closed) from the Reactor Building spray pump circuit breaker.

Postulated failure of SV-3804 would cause closure of the Reactor Building spray pumps lube oil cooler E47A inlet valve CV-3804. The postulated failure of CV-3804 due to excessive irradiation would result from a LOCA. The radiation source is several recirculating water lines containing recirculated spray and injection water.

Upon the occurrence of a LOCA, the Reactor Building pressure increases to 30 psig, a Reactor Building signal initiates spray, and SV-3804 energizes to open CV-3804. After approximately 75 minutes the Reactor Building pressure will be reduced to 5 psig as shown in the FSAR. Also, at this time the Borated Water Storage Tank will be depleted and recirculation will be initiated. Time to depletion is based on flow

rates for a design basis LOCA. Postulated failure of SV-3804 due to excessive dosage would not be expected to occur for at least 8 hours after recirculation is initiated. Therefore, based on engineering judgement, SV-3804 will have sufficient time to perform its safety function before postulated failure. Also, the Reactor Building spray pumps, which have bearing temperature inputs to the computer, could be intermittently and alternately operated within the limits of their operation temperature if further use of the spray system was required. The pumps are capable of operating without lube oil cooling for a significant amount of time before the bearings would reach temperatures that could lead to failures. In addition, if bearing temperature indicated that the valve had failed and re-closed, the valve could be reopened by removing air from the operator; CV-3804 is spring-opened and any air failure will cause the valve to go to its safeguards position. The Reactor Building emergency cooling system serves as a safety related fully redundant system, to the Reactor Building spray system for reactor building cooling.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Spray Pump Lube Oil Cooler Inlet Control
Valve Solenoid Valve

TAG NO(S).: SV-3805

SER RESPONSE PAGE NO(S).: B030

FRC EQUIPMENT ITEM: 44

MANUFACTURER AND MODEL NO.: ASCO 8320 A108

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 10

• SAFETY FUNCTION:

SV-3805 energizes to open Reactor Building spray pump P35B lube oil cooler E47B inlet valve CV-3805. SV-3805 energizes when pump P35B starts.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR INTERIM OPERATION:

With the exception of radiation, environmental parameters causing discrepancies are due to a Reactor Coolant letdown line break outside of the Reactor Building. SV-3805, which opens the Reactor Building spray pump P35B Lube Oil cooler E47B inlet valve CV-3805, is not required to operate for the specified environmental parameters. SV-3805 is energized off an "A" contact (contact closed when breaker is closed) from the Reactor Building spray pump circuit breaker.

Postulated failure of SV-3805 would cause closure of the Reactor Building spray pumps lube oil cooler E47B inlet valve CV-3805. The postulated failure of CV-3805 due to excessive irradiation would result from a LOCA. The radiation source is several recirculating water lines containing recirculated spray and injection water.

Upon the occurrence of a LOCA, the Reactor Building pressure increases to 30 psig, a Reactor Building spray system Engineered Safeguards Actuation System signal initiates spray, and SV-3805 energizes to open CV-3805. After approximately 75 minutes the Reactor Building pressure will be reduced to 5 psig as shown in the FSAR. Also at this time, the

Borated Water Storage Tank will be depleted and recirculation will be initiated. Time to depletion is based on flow rates for a design basis LOCA. Postulated failure of SV-3805 due to excessive dosage would not be expected to occur for at least 250 hours after recirculation is initiated.

Therefore, based on engineering judgement, SV-3805 will have sufficient time to perform its safety function before postulated failure.

Also, the Reactor Building spray pumps, which have bearing temperature inputs to the computer, could be intermittently and alternately operated within the limits of their operation temperature if further use of the spray system was required. The pumps are capable of operating without lube oil cooling for a significant period of time before the bearings would reach temperatures leading to failure.

In addition, if valve position or bearing temperature indicated that the valve had failed and re-closed, the valve could be re-opened by removing air from the operator; CV-3805 is spring-to-open and any air failure will cause the valve to go to its safeguards position.

The Reactor Building Emergency Cooling System serves as a safety related fully redundant system, to the Reactor Building spray system for reactor building cooling.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve

TAG NO(S).: SV-3814

SER RESPONSE PAGE NO(S).: B037

FRC EQUIPMENT ITEM: 47

MANUFACTURER AND MODEL NO.: ASCO 8316 B17

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 46

• SAFETY FUNCTION:

SV-3814 is required to energize to open CV-3814 upon receipt of a reactor building isolation signal from Engineered Safeguards Actuation System (ESAS). CV-3814 is the reactor building service water cooling coils (VCC-2A and VCC-2B) discharge isolation valve.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

SV-3814 is required to energize for an initiating event occurring inside of the Reactor Building. For this event, SV-3814 which is located outside of the Reactor Building, will not experience a harsh environment. SV-3814 will be subjected to a harsh environment only following a reactor coolant letdown line break or a HELB outside of the Reactor Building, for which SV-3814 has no safety function.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters following a LOCA. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 3.2 E5 rads to this component must be considered.

The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to SV-3814 during this period. At the time the Hydrogen Purge System is placed in service, the Reactor Building pressure and temperature will have returned to near normal conditions (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System.

In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of Reactor Building heat removal.

AP&L will replace this device with a fully qualified substitute by the next refueling outage.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve

TAG NO(S).: SV-3815

SER RESPONSE PAGE NO(S).: B039

FRC EQUIPMENT ITEM: 48

MANUFACTURER AND MODEL NO.: ASCO 8316 B17

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 79

• SAFETY FUNCTION:

SV-3815 is required to energize to open CV-3815 upon receipt of a reactor building isolation signal from Engineering Safeguards Actuation System (ESAS). CV-3815 is the reactor building service water cooling coils (VCC 2C and VCC 2D) discharge isolation valve.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

SV-3815 is required to provide its safety function for an initiating event occurring inside of the Reactor Building. For this event, SV-3815, which is located outside of the Reactor Building, will not experience a harsh environment. SV-3815 will be subjected to a harsh environment only following a Reactor Coolant letdown line break or a Main Feedwater line break, for which SV-3815 has no safety function. The other outstanding qualification discrepancy for SV-3815 is the specified one year integrated radiation dose. Two main contributors in Room 79 were identified for this dose. The major contributor is the dose due to recirculation of LOCA fluids of 2.5 E6 rads.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 1.4 E5 rads to this component must be considered.

The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to SV-3814 during

this period. At the time the Hydrogen Purge System is placed in service, the Reactor Building pressure and temperature will have returned to near normal conditions (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System.

In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of Reactor Building heat removal.

AP&L will replace this device with a fully qualified substitute by the next refueling outage.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Pump Bearing Cooler Inlet Valve Solenoid

TAG NO(S).: SV-3840

SER RESPONSE PAGE NO(S).: B044

FRC EQUIPMENT ITEM: 46

MANUFACTURER AND MODEL NO.: ASCO 8320A108

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 14

• SAFETY FUNCTION:

SV-3840 energizes to open decay heat removal pump P34A bearing cooler E50A inlet valve CV-3840. SV-3840 energizes when pump P34A starts.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR INTERIM OPERATION:

Except for radiation, environmental parameters causing discrepancies are due to a Reactor Coolant letdown line break outside of containment. SV-3840 which opens decay heat removal pump P34A bearing cooler E50A inlet valve CV-3840, is not required to operate for the specified environmental parameters.

The exposure from radiation results from the recirculation phase following a LOCA. Eventual failure of the valve could result from this exposure; however, LPI injection prior to recirculation does not involve any radiation exposure and begins, at the earliest, 75 minutes following the event. Postulated failure is not expected to occur for approximately 30 days at which time accumulated dose reaches 1×10^6 rads. This corresponds to the damage threshold of Buna N, believed to be the limiting material in this device.

In addition, the LPI pumps, which have bearing temperature monitored and available in the plant computer, could be intermittently operated within the limits of their bearing temperature if necessary. The pumps are capable of operating for a significant period of time without cooling water before the bearings would reach conditions leading to

pump failure. Also, if valve position or bearing temperature indicated that the valve had failed and reclosed, the valve could be reopened by removing air from the operator; valve CV-3840 is spring-to-open, and any air failure would cause the valve to go to its safeguards position.

Based on expected failure mechanisms and realistic assumptions, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Pump Bearing Cooler Inlet Valve Solenoid Valve

TAG NO(S).: SV-3841

SER RESPONSE PAGE NO(S).: B046

FRC EQUIPMENT ITEM: 46

MANUFACTURER AND MODEL NO.: ASCO 8320A108

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 10

• SAFETY FUNCTION:

SV-3841 energizes to open Decay Heat pump P34B bearing cooler E50B inlet valve CV-3841. SV-3841 energizes when pump P34B starts.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR INTERIM OPERATION:

Except for radiation, environmental parameters causing discrepancies are due to a Reactor Coolant letdown line break outside of the Reactor Building. SV-3841, which opens Decay Heat pump P34B bearing cooler E50B inlet valve CV-3841, is not required to operate for the specified environmental parameters.

The exposure from radiation results from the recirculation phase following a LOCA. Eventual failure of the valve could result from this exposure; however, it does not begin until 75 minutes following the LOCA.

Postulated failure is not expected to occur for approximately 11 days, at which time the accumulated exposure is approaching 1×10^6 rads. This level corresponds to the radiation damage threshold value for Buna-N material, which is believed to be the limiting material in this device.

In addition, the LPI pumps, which have bearing temperature available on the plant computer, could be intermittently operated within the limits of their bearing temperature if necessary. Also, if valve position or bearing temperature indicated that the valve had failed and reclosed, it could be reopened by removing air from the valve operator; valve CV-3841 is spring-to-open and any air failure would cause the valve to go to its safeguards position.

The pumps are capable of operating without cooling water for a significant period of time before the bearings would reach temperatures leading to pump failure.

Based on expected failure mechanisms and realistic assumptions, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Cooling Unit Bypass Damper Motors

TAG NO(S).: SV-7410, SV-7411, SV-7412, SV-7413

SER RESPONSE PAGE NO(S).: A077, A079, A081, A083

FRC EQUIPMENT ITEM: 114

MANUFACTURER AND MODEL NO.: Reliance Model #707681-KX

SYSTEM - P&ID NO.: HVAC Reactor Building - M-261

LOCATION: Reactor Building

• SAFETY FUNCTION:

The safety function of these motors is to open the cooling unit dampers upon receipt of an Engineered Safeguards Actuation Signal. This bypasses the chilled water coils (and associated pressure drop) allowing the units to achieve rated cooling capacity.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of these motors.

• JUSTIFICATION FOR INTERIM OPERATION:

Upon receipt of an ESAS signal, the motors rotate a camshaft which trips open the dampers after only one-quarter of a revolution. The dampers open by gravity and can be reset only by jacking them shut and resetting the latches. The ESAS signal occurs at a containment pressure of 4 psig.

Because the required operating time is very short for these motors (less than one minute), the environmental conditions are not of a duration expected to prevent the motors from completing their function. The accident radiation exposure could not accumulate to a significant level (if any at all), and the temperature spike would not adversely affect the motor due to thermal inertia. The containment spray does not actuate until 30 psig; therefore, considering the time lag for spray initiation, this could not prevent the completion of the function.

In addition, the design basis for the reactor building cooling system provides that the required cooling functions can be accomplished by both loops of the containment spray system. Even if the motors failed to trip the dampers reactor building cooling would still be available from these units though at a reduced cooling capacity.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Coolant Hot Leg Temperature Element (RTD)

TAG NO(S): TE 1012, TE 1013, TE 1040, TE 1041

SER RESPONSE PAGE NO(S): A019, A020, A038, A040

FRC EQUIPMENT ITEM: 63 and 64

MANUFACTURER AND MODEL NO.: Rosemount 177JD/GY/HW

SYSTEM - P&ID NO.: Reactor Coolant System - M230

LOCATION: Reactor Building

• SAFETY FUNCTION:

Measures reactor coolant hot leg temperatures, providing inputs to the Reactor Protection System for reactor trip on high temperature; also used to determine adequate core cooling, subcooling margin, and conditions for natural circulation cooldown.

• QUALIFICATION DISCREPANCY:

According to Franklin, similarity, aging, accuracy, functional testing were not adequately evaluated.

• JUSTIFICATION FOR CONTINUED OPERATION:

The high temperature reactor trip is a steady state trip function and is not required following a LOCA. Low RCS pressure or high reactor building pressure provide diverse reactor trip functions following a LOCA. Hot leg temperature is not required (for reactor trip) for any Chapter 14 transients (i.e., LOCA or MSLB).

Incore thermocouples may be used to determine adequate core cooling, subcooling margin and conditions for natural circulation. Based on experience from the TMI-2 accident, incore thermocouples would be expected to survive the accident environment for sufficient time to provide this information. Readouts from 16 incores are available to the operator on the SPDS.

The temperature element itself has been subjected to 600°F and 3215 psig. The connector head assembly has been exposed to 80 psig and submerged to demonstrate leak tightness. According to B&W, the materials were chosen to withstand at least 240°F and 1×10^8 rads. In addition, similar RTD's have been tested to 325°F and 3.8×10^8 rads. Based on recently acquired documentation, AP&L considers these RTD's qualified.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Coolant Cold Leg Temperature Element (RTD)

TAG NO(S).: TE 1016, TE 1017, TE 1045, TE 1047

SER RESPONSE PAGE NO(S).: A021, A022, A041, A042

FRC EQUIPMENT ITEM: 62 and 64

MANUFACTURER AND MODEL NO.: Rosemount 177JD

SYSTEM - P&ID NO.: Reactor Coolant System, M-230

LOCATION: Reactor Building

• SAFETY FUNCTION:

These sensors are not inputs to Reactor Protection, Engineered Safeguards Actuation or Steam Line Break Isolation logic, therefore, perform no automatic mitigation function. Indication is provided to the control room for determining adequate core cooling, and conditions for natural circulation cooldown.

• QUALIFICATION DISCREPANCY:

Similarity, aging, accuracy, functional testing

• JUSTIFICATION FOR CONTINUED OPERATION:

These sensors are not used to perform any automatic protective action, therefore their unavailability will not inhibit automatic emergency core cooling or reactor trip.

Incore thermocouples may be used to determine adequate core cooling, and conditions for natural circulation. Based on experience from the TMI-2 accident, incore thermocouples would be expected to survive the accident environment for sufficient time to provide this information. Readouts from 16 incore thermocouples are available to the operator on the SPDS.

The temperature element itself has been subjected to 600°F and 3215 psig. The connector head assembly has been exposed to 80 psig and submerged to demonstrate leak tightness. According to B&W, the materials were chosen to withstand at least 240°F and 1×10^8 rads. In addition, similar RTD's have been tested to 325°F and 3.8×10^8 rads. Based on recently acquired documentation, AP&L considers these devices fully qualified.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Temperature Switch

TAG NO(S): TS-7441A, -7441B

SEE RESPONSE PAGE NO(S): B128, B129

FRC EQUIPMENT ITEM: 90, 91

MANUFACTURER AND MODEL NO.: Fenwal 18001-21

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 46

• SAFETY FUNCTION:

To control the Hydrogen Purge System heaters VEH-6A and 6B during post-LOCA hydrogen purge operations.

• QUALIFICATION DISCREPANCY:

According to the Franklin Technical Evaluation Report, inadequate evidence was provided to identify the temperature switch tested in the report referenced by AP&L.

• JUSTIFICATION FOR CONTINUED OPERATION:

The environmental conditions listed on the worksheet represent those due to a High Energy Line Break for Room 46 (except for radiation); however, the device is needed for LOCA conditions only. Room 46 is a "mild" environment during a LOCA. The recirculation of LOCA fluids results in an insignificant radiation dose in Room 46. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne iodines from the containment, an exposure of 8.8 ±5 rads to this component must be considered.

If the purge system failed, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

A materials breakdown of the temperature switch model used in ANO-1 is as follows:

<u>Material Function</u>	<u>Material</u>
a. Lead wire	Teflon impregnated tape, asbestos tape and glass braid
b. Temperature adjusting	Brass
c. Expanding shell	Stainless steel
d. Wall insulation	Ceramic
e. Terminal insulation	Mica
f. Contacts	Brass and copper
g. Hermetic seals	Glass

The only material with potential for significant radiation deterioration is teflon. However, the function of the teflon tape is to provide abrasion resistance to the wires (it does not function as an electrical insulator); therefore, the postulated loss of integrity of the teflon would not affect the functioning of the temperature switch.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Temperature Switch

TAG NO(S).: TS-7442A, -7442B

SER RESPONSE PAGE NO(S).: B132, B133

FRC EQUIPMENT ITEM: 89

MANUFACTURER AND MODEL NO.: Fenwal 18002-21

SYSTEM - P&ID NO.: Reactor Building HVAC, M-261

LOCATION: Room 79

• SAFETY FUNCTION:

To control the Hydrogen Purge System heaters VEH-6A and 6B during post-LOCA hydrogen purge operations.

• QUALIFICATION DISCREPANCY:

According to the Franklin Technical Evaluation Report, inadequate evidence was provided to identify the temperature switch tested in the report referenced by AP&L

• JUSTIFICATION FOR CONTINUED OPERATION:

The environmental conditions listed on the worksheet represent those due to a High Energy Line Break for Room 79 (except for radiation); however, the device is needed for LOCA conditions only. Room 46 is a "mild" environment during a LOCA. The recirculation of LOCA fluids results in a maximum radiation dose of 2.5 E6 rads in Room 79. However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne iodines from the containment, an additional exposure of 3.7 E6 rads to this component must be considered.

If the purge system failed, the redundant train could be switched on. In addition, ANO has the capability for hookup to external hydrogen recombiners should they become necessary.

A materials breakdown of the temperature switch model used in ANO-1 is as follows:

<u>Material Function</u>	<u>Material</u>
a. Lead wire	Teflon impregnated tape, asbestos tape and glass braid
b. Temperature adjusting	Brass
c. Expanding shell	Stainless steel
d. Wall insulation	Ceramic
e. Terminal insulation	Mica
f. Contacts	Brass and copper
g. Hermetic seals	Glass

The only material with potential for significant radiation deterioration is teflon. However, the function of the teflon tape is to provide abrasion resistance to the wires (it does not function as an electrical insulator); therefore, the postulated loss of integrity of the teflon would not affect the functioning of the temperature switch.

Based on the above, there is no significant degradation of safety function or misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Penetration Room Ventilation Valve Position Switches

TAG NO(S).: ZS-2123, ZS-2126, ZS-2133, ZS-2136

SER RESPONSE PAGE NO(S).: B178, B176, B172, B170

FRC EQUIPMENT ITEM: 67, 68, 69

MANUFACTURER AND MODEL NO.: NAMCO D2400X

SYSTEM - P&ID NO.: Reactor Building Penetration Room Ventilation M-264

LOCATION: Room 47

• SAFETY FUNCTION:

The safety function of these position switches is to permit the reactor operator to verify the associated valve position.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

The qualification discrepancies (except for radiation) for these position switches results from a High Energy Line Break (HELB) outside the reactor building. Since the safety function of the switches requires operability after a LOCA which occurs inside the reactor building, the required safety operation of the switches is not jeopardized.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Penetration Room Ventilation filters. If the unit in Room 47 is conservatively assumed to filter 50% of the airborne Iodines from the containment, an exposure of 1.9 E5 rads for these components must be considered.

AP&L had previously determined that these items performed their safety functions in a mild environment; however, considering the recently determined additional dose, AP&L is replacing these devices with fully qualified switches.

If the switches were to fail, the appropriate valve positions, could be inferred by the flow measurements available. In addition, two trains are available. Considering the design of these switches and applicable exposures, the devices are considered capable of withstanding the dose.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Main Steam Isolation Valve Position Switch

TAG NO(S).: ZS-2691

SER RESPONSE PAGE NO(S).: B014

FRC EQUIPMENT ITEM: 65

MANUFACTURER AND MODEL NO.: Namco model EA700-86010

SYSTEM - P&ID NO.: Steam Generator Secondary M-206

LOCATION: Room 170

• SAFETY FUNCTION:

To provide position indication of main steam discharge isolation valve CV-2691.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of this device.

• JUSTIFICATION FOR INTERIM OPERATION:

Environmental parameters causing the discrepancies of ZS-2691 are due to a main steam line break located downstream of the containment penetration of steam line A.

ZS-2691 provides position indication for CV-2691. CV-2691 is the main steam isolation valve for steam generator E24A. A main steam line break will initiate a Steam Line Break Isolation Channel signal, which will de-energize solenoid valves SV-2691 and SV-2692, causing closure of valves CV-2691 and CV-2692. Failure of position indication does not degrade any safety function. Other means are available for the operator to assure that closure of the MSIV's has taken place. For example, pressure transmitters PIT-6676 and PIT-6677, located at the main turbine, will verify closure of the valves via pressure recorders PR-6676 and PR-6677.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Main Steam Isolation Valve Position Switch

TAG NO(S).: ZS-2692

SER RESPONSE PAGE NO(S).: B016

FRC EQUIPMENT ITEM: 65

MANUFACTURER AND MODEL NO.: NAMCO EA700-86010

SYSTEM - P&ID NO.: Steam Generator Secondary M-206

LOCATION: Room 170

• SAFETY FUNCTION:

Provides position indication of main steam discharge isolation valve CV-2692.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of this device.

• JUSTIFICATION FOR INTERIM OPERATION:

Environmental parameters causing discrepancies of ZS-2692 would result from a postulated main steam line break in the steam generator E24A discharge line outside of containment. ZS-2692 provides position indication of CV-2692. CV-2692 is the main steam isolation valve for steam generator E24B. A MSLB will initiate a Steam Line Break Isolation Channel signal, which will de-energize MSIV solenoids SV-2691 and SV-2692, causing closure of CV-2692. Failure of ZS-2692 will not degrade any safety-related function. Pressure transmitters PIT-6676 and PIT-6677, located at the main turbine, will verify closure of CV-2692 via pressure recorder PR-6677.

These switches were designed for rugged service conditions (e.g., 150°C), but in the absence of formal qualification testing, AP&L will replace this device by the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Spray Pump Lube Oil Cooler Inlet Valve
Position Switch

TAG NO(S): ZS-3804

SER RESPONSE PAGE NO(S): B029

FRC EQUIPMENT ITEM: 77

MANUFACTURER AND MODEL NO.: Micro 51ML17

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 13

• SAFETY FUNCTION:

Provides position indication of Reactor Building spray pumps lube oil cooler E47A inlet valve CV-3804.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of this device.

• JUSTIFICATION FOR INTERIM OPERATION:

With the exception of radiation, environmental parameters causing discrepancies are due to a Reactor Coolant letdown line break outside of the Reactor Building. Position indication of the Reactor Building spray pumps lube oil cooler E47A inlet valve CV-3804 is not a safety function for a letdown line break.

Since actuation of the valve is automatic, postulated failure of the position indication switch would not mislead the operator. Proper cooling water flow to the bearing lube oil coolers could be verified by monitoring the bearing temperature on the plant computer.

The initial function of the spray pumps is assured since the radiation exposure does not begin until after recirculation is started. The reactor building cooling function can be satisfied by the reactor building cooling units.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: RB Spray Pump Lube Oil Cooler Inlet Valve Position Switch

TAG NO(S).: ZS-3805

SER RESPONSE PAGE NO(S).: B031

FRC EQUIPMENT ITEM: 78

MANUFACTURER AND MODEL NO.: Micro 51ML17 SN7224

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 10

• SAFETY FUNCTION:

Provides position indication of Reactor Building spray pumps lube oil cooler E47B inlet valve CV-3805.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of this device.

• JUSTIFICATION FOR INTERIM OPERATION:

With the exception of radiation, environmental parameters causing failure of ZS-3805 are due to a reactor coolant letdown line break outside of containment. Position indication of the Reactor Building spray pumps Lube Oil cooler E47B inlet valve CV-3805 is not a safety function for the specified conditions due to a letdown line break.

Since actuation of the valve is automatic, the position indication switch postulated failure would not mislead the operator. Proper cooling water flow to the bearing lube oil coolers could be verified by monitoring the bearing temperature on the plant computer.

The initial function of the spray pumps is assured since the radiation exposure does not begin until after recirculation is started. The reactor building cooling function can be satisfied by the reactor building cooling units.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION

ANO-1

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve
Position Switch

TAG NO(S).: ZS-3814

SER RESPONSE PAGE NO(S).: B038

FRC EQUIPMENT ITEM: 56

MANUFACTURER AND MODEL NO.: NAMCO D2400X

SYSTEM - P&ID NO.: Service Water System M-210

LOCATION: Room 46

• SAFETY FUNCTION:

ZS-3814 indicates the position of valve CV-3814 to the operator.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

ZS-3814 is required to provide its safety function for an initiating event occurring inside of containment. For this event, ZS-3814, which is located outside of containment, will not experience a harsh environment. ZS-3814 will be subjected to a harsh environment only following a reactor coolant letdown line break or a Main Feedwater line break for which ZS-3814 has no safety function.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 46 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an exposure of 3.2 E5 rads to this component must be considered.

The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to SV-3814 during this period. At the time the Hydrogen Purge System is placed in service, the Reactor Building pressure and temperature will have returned to near normal conditions (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System. Even if position indication were lost, valve position could be inferred from available flow indication.

In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of Reactor Building heat removal.

AP&L will replace this device with a fully qualified substitute by the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Service Water Cooling Coils Isolation Valve
Position Switch

TAG NO(S): ZS-3815

SER RESPONSE PAGE NO(S): B040

FRC EQUIPMENT ITEM: 70

MANUFACTURER AND MODEL NO.: HAMCO D2400X

SYSTEM - P&ID NO.: Service Water System M210

LOCATION: Room 79

• SAFETY FUNCTION:

ZS-3815 indicates the position of valve CV-3815 to the operator.

• QUALIFICATION DISCREPANCY:

According to Franklin, the documented evidence of qualification is inadequate.

• JUSTIFICATION FOR CONTINUED OPERATION:

ZS-3815 is required to provide its safety function for an initiating event occurring inside of the Reactor Building. For this event, ZS-3815, which, which is located outside of the Reactor Building will not experience a harsh environment. ZS-3815 will be subjected to harsh environment only following a Reactor Coolant letdown line break or a Main Feedwater line break, for which ZS-3815 has no safety function.

This device was considered not qualified due to the recirculation dose due to a LOCA of 2.5 EG rads.

However, previous radiation dose considerations did not include the source due to buildup of activity in the Hydrogen Purge Unit filters. If the purge unit in Room 79 is conservatively assumed to filter 100% of the airborne Iodines from the containment, an additional exposure of 1.4 E5 rads to this component must be considered.

The Hydrogen Purge System is not required to operate during the first 11.5 days following a LOCA (Re: FSAR Section 6.6). Therefore, the Hydrogen Purge Unit filters will not provide radiation exposure to ZS-3815 during this period. At the time the Hydrogen Purge System is placed in service, the Reactor Building pressure and temperature will have returned to near normal conditions. (Re: FSAR Figure 14-61) via operation of the Reactor Building Coolers and Spray System.

Even if position indication were lost, valve position could be inferred from available flow indication.

In addition, as noted in FSAR Section 6.3.3, the Reactor Building Spray System provides a redundant means of reactor building heat removal.

AP&L will replace this device with a fully qualified substitute by the next refueling outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Pump Bearing Cooler Inlet Valve Position Switch

TAG NO(S).: ZS-3840

SER RESPONSE PAGE NO(S).: B045

FRC EQUIPMENT ITEM: 76

MANUFACTURER AND MODEL NO.: Micro 51 ML17

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 14

• SAFETY FUNCTION:

Provides position indication of Decay Heat pumps bearing cooler E50A inlet valve CV-3840.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of this device.

• JUSTIFICATION FOR INTERIM OPERATION:

Except for radiation, environmental parameters causing discrepancies of ZS-3840 are due to a reactor coolant letdown line break outside of the Reactor Building. Position indication of the Decay Heat pumps bearing cooler E50A inlet valve CV-3840 is not a safety function for the specified conditions.

The maximum postulated radiation exposure due to recirculation of LOCA fluids for one year is less than 2×10^6 rads. Although, an exact materials analysis has not been performed for this device, it is not expected to fail from this exposure due to its simple design and construction.

In addition, exposure does not begin until the BWST supply is depleted which at the earliest would not occur for 75 minutes following the accident, allowing ample time for the operator to verify that service water is being supplied to the bearing coolers. Should the switch eventually fail due to continued radiation exposure, the operator can infer the existence of service water supply by monitoring bearing temperature on the plant computer.

Therefore, loss of indication is not considered crucial to mitigating the accident and is not critical as a monitoring function.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Decay Heat Pump Bearing Cooler Inlet Valve Position Switch

TAG NO(S).: ZS-3841

SER RESPONSE PAGE NO(S).: B047

FRC EQUIPMENT ITEM: 74

MANUFACTURER AND MODEL NO.: Micro Z000166A

SYSTEM - P&ID NO.: Service Water M-210

LOCATION: Room 10

• SAFETY FUNCTION:

Provides position indication of Decay Heat pumps bearing cooler E50B inlet valve CV-3841.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of this device.

• JUSTIFICATION FOR INTERIM OPERATION:

Environmental parameters causing discrepancies of ZS-3841 are due to a reactor coolant letdown line break outside of containment. Position indication of the Decay Heat pumps bearing cooler E50B inlet valve CV-3841 is not a safety function for the specified conditions. The only potential harsh parameter is radiation due to recirculation of LOCA fluids. The maximum postulated dose is approximately 2 E6 rads.

Although an exact material analysis has not been performed, these devices are not expected to fail from radiation exposure based on their simple design and construction. The radiation exposure does not begin until the associated valve has been open for more than 75 minutes (during LPI injection from BWST).

Should the switch fail, the operator could infer service water supply to the bearing coolers by monitoring bearing temperature on the plant computer. Loss of indication due to eventual switch failure is not considered crucial to mitigating the accident and is not critical for monitoring purposes.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Cooling Unit Damper Overtravel Protection Switches

TAG NO(S).: ZS-7406, ZS-7408, ZS-7424, ZS-7426

SER RESPONSE PAGE NO(S).: A073, A075, A089, A091

FRC EQUIPMENT ITEM: 73

MANUFACTURER AND MODEL NO.: General Electric (CR9440 D2CA)

SYSTEM - P&ID NO.: HVAC - Reactor Building M261

LOCATION: Reactor Building

• SAFETY FUNCTION:

The function of these limit switches relates to resetting the damper motor and damper after it has tripped or following testing.

• QUALIFICATION DISCREPANCY:

According to Franklin, inadequate documentation was provided to support qualification of these items.

• JUSTIFICATION FOR INTERIM OPERATION:

The environmental parameters specified for these switches are the calculated results for the design basis LOCA. These limit switches are not required to operate to mitigate the effects of a LOCA. The overprotection close limit switches are only used when the dampers are returned to their normal closed position after a test or safety related opening.

However, a failure can be postulated which could prevent the accomplishment of safety function of the damper motors. Should the switches remain functional for approximately two seconds, the operation of the damper motors is assured. Even should the failure occur and the dampers not open, reactor building cooling would be available with these units, though at a reduced rate.

In addition, the Reactor Building Spray system provides a redundant means of maintaining reactor building cooling. Even though this event is considered unlikely, these switches will be replaced by the upcoming outage.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Cooling Unit Damper Position Switches

TAG NO(S).: ZS-7407, ZS-7409, ZS-7425, ZS-7427

SER RESPONSE PAGE NO(S).: A074, A076, A090, A092

FRC EQUIPMENT ITEM: 73

MANUFACTURER AND MODEL NO.: General Electric CR9440 D2CA

SYSTEM - P&ID NO.: HVAC - Reactor Building M261

LOCATION: Reactor Building

• SAFETY FUNCTION:

The safety function for these limit switches is to complete the circuit which lights a red indicating light in the control room. The red indicating light designates that the Reactor Building cooling unit damper is in its open safety position.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR INTERIM OPERATION:

The switches perform no automatic functions but are needed to confirm the opening of the Reactor Building Cooling Coil bypass dampers. Subsequent failure of these switches would not prevent the opening of the dampers. Should the switches fail, the operator could infer proper reactor building cooling by monitoring reactor building temperature.

Monitoring of the damper door position is not considered a critical post-accident monitoring function.

In addition, the reactor building spray system provides an alternate means of maintaining reactor building cooling.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANC-1

COMPONENT: Reactor Building Cooling Unit Damper Overtravel Protection Switches

TAG NO(S).: ZS-7410, ZS-7411, ZS-7412, ZS-7413

SER RESPONSE PAGE NO(S).: A078, A080, A082, A084

FRC EQUIPMENT ITEM: 73

MANUFACTURER AND MODEL NO.: General Electric CR9440 D2CA

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Reactor Building

• SAFETY FUNCTION:

The safety function of these limit switches is to provide overtravel protection for the damper motors.

• QUALIFICATION DISCREPANCY:

According to Franklin, documented evidence of qualification is inadequate.

• JUSTIFICATION FOR INTERIM OPERATION:

These devices perform no vital safety function but are provided to protect the damper motors. After the motor has tripped the dampers, a failure of the switches could cause the motors to burn out; however, once the dampers are opened, the motors have no safety function and their subsequent failure is of no concern. In addition, these devices perform their function within seconds of a LOCA and are expected to complete their function before the environmental conditions could induce failures.

In addition, the reactor building spray system provides an alternate means of maintaining reactor building cooling.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.

EQUIPMENT ENVIRONMENTAL QUALIFICATION
JUSTIFICATION FOR CONTINUED OPERATION
ANO-1

COMPONENT: Reactor Building Cooling Unit Damper Position Switches

TAG NO(S).: ZS-7420-1, ZS-7421-1, ZS-7422-1, ZS-7423-1, ZS-7420-2,
ZS-7421-1, ZS-7422-2, ZS-7423-1

SER RESPONSE PAGE NO(S).: A085, A086, A087, A088

FRC EQUIPMENT ITEM: 73

MANUFACTURER AND MODEL NO.: General Electric CR9440

SYSTEM - P&ID NO.: HVAC - Reactor Building M-261

LOCATION: Reactor Building

• SAFETY FUNCTION:

The safety function of four of these limit switches is (designated-2) to complete the circuit which lights a green indicating light in the control room. The green light designates that the Reactor Building cooling unit damper is closed.

• QUALIFICATION DISCREPANCY:

According to Franklin, no documentation has provided to support qualification of these items.

• JUSTIFICATION FOR ITEM OPERATION:

These switches perform no automatic functions but are only needed to determine the closure of the Reactor Building Cooling Coil bypass dampers. Failure of these switches would not prevent the opening of the dampers. Should the switches fail, the operator could infer proper reactor building cooling by monitoring reactor building temperature.

Limit switches ZS-7420-1, -7421-1, -7422-1, and -7423-1 perform non-essential functions however, a failure could be postulated that could prevent the accomplishment of safety-function of the damper motors. Though such a failure is highly unlikely, these devices will be replaced during the upcoming outage. Should these switches remain functional for approximately two seconds, the operation of the dampers is assured. Should the failure occur and the dampers not open, reduced reactor building cooling would still be available with these units.

In addition, the reactor building spray system provides an alternate means of maintaining reactor building cooling.

Based on the above, there is no significant degradation of safety function or significantly misleading information to the operator as a result of equipment failure from the accident environment resulting from a design basis event.